

THE INFLUENCE OF FEEDING PRACTICES ON THE
NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN:
A CASE OF NDIVISI LOCATION, BUNGOMA DISTRICT,
WESTERN KENYA

BY

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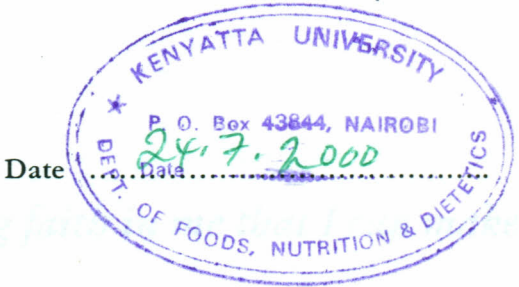
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CERTIFICATION

We the undersigned University supervisors certify that we have read and hereby recommend for acceptance by Kenyatta University a thesis entitled: *The Influence of Feeding Practices on the Nutritional Status of Pre-school Children: A Case of Ndivisi Location, Bungoma District, Western Kenya*, in partial fulfillment for the degree of Master of Education (In Home Economics).

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DEDICATION

To my Dear Father, for having faith in me that I can make it.

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I once again thank the two ladies Emily and Beatrice for their assistance in data collection and in identifying homes with pre-school children.

Lastly to God the almighty for his sustenance and sufficient Grace.

ABSTRACT

The purpose of the study was to find out child feeding patterns that may have had an influence on the nutritional status of pre-school children. Cluster sampling method was used to select eight villages within Ndivisi location for purposes of the study. Purposive sampling method was used to identify 100 households with children between the age of 6-60 months. Additionally anthropometric measurements of 119 children were taken.

Results of the study show that there was existence of malnutrition among children, with (18.5%) of children between the age of 13-24 months suffering from stunting and (17.6%) within the same age bracket suffering from wasting. Demographic information of the respondents showed that 34% of the households had between 4-6 members, while (32%) of the mothers had only received primary level education. Socio-economic status of the population indicates that very few household heads 22.8% had permanent employment and were thus earning a steady income. Those involved in petty businesses (27%) did not consider it to be employment.

The most common illness among the sampled population, was fever with 25.4% suffering from it within the last seven days before the research was carried out. The other common ailment was diarrhea (22.1%).

Child feeding patterns showed that, 70.7% of the mothers stopped breast-feeding their children when they were between the age of 1-2 years, while the most common types of weaning foods given to pre-school children were of the carbohydrate group 41%, the most

common being maize meal porridge. Further results showed that (69%) of the pre-school children were subject to taboos related to food, where 51.9% of the children were not supposed to eat meat or drink milk from the *eng'enda* cow.

Correlations carried out on the relationship between nutritional status and the demographic characteristics of the respondents showed that there was a high positive correlation of 0.8 where the significant level $p=0.5$ between the educational level of the respondents and the weight for age status of pre-school children. There was also a high positive correlation of 0.9 where the significant level $p=0.5$ between the occupation status of the respondents and the height for age index of pre-school children.

From the analysis it is evident that the poor nutritional status of pre-school children could be attributed to lack of steady incomes both by household heads and mothers, low levels of education especially by the mothers, poor weaning and feeding practices of pre-school children and the existence of food taboos. Other likely causes could have been prevalence of illnesses and poor sanitary conditions.

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LIST OF SYMBOLS AND ABBREVIATIONS

WHO:	World Health Organisation
UNICEF:	United Nations Children's Fund
GOK:	Government of Kenya
NUS:	Nutritional Status
HES:	Health Status
H/A:	Height for Age
W/A:	Weight for Age
H/W:	Height for Weight
NCHS:	National Centre for Health and Statistics

CHAPTER 1

1.0 INTRODUCTION

1.1: BACKGROUND INFORMATION

The need for food is among the basic needs of all human beings. It determines the nutritional status of a population. In 1998, UNICEF emphasized the fact that good nutrition is not only the key to the healthy development of individuals, families and societies, but helps in overcoming great health challenges such as chronic and degenerative diseases. It further categorizes groups most vulnerable to poor nutrition as children, pregnant and lactating mothers.

While good nutrition is essential for everybody, it is especially crucial for children under the age of five years as it is at this age, when there is rapid growth and development of the brain. Further, well nourished children grow into more productive adults, whereby especially girls grow into women with fewer risks during pregnancy and childbearing, and whose children set out on firmer developmental paths, physically and mentally.

Rural populations in most developing countries do not even have the most basic healthcare facilities, and children are malnourished from the very first day of life (WHO, 1981). This is the cause of social and economic underdevelopment, as malnutrition usually stems from poverty, under-nutrition, disease and cultural aspects. WHO, (1981) continues to exemplify Protein Energy Malnutrition as a common condition among children under five years of age in undernourished communities. For instance, some countries have 4 out of 5 young children with this form of malnutrition and 1 out of 10 who end up being seriously affected by it. On

the other hand, UNICEF, (1998) adds that of the 226 million children under 5 years in developing countries, nearly 40 percent of this age group suffer from moderate or severe stunting.

There exists a lot of consensus on the fact that Nutrition is highly correlated with poverty for the simple reason that poor people are less able to buy adequate and nutritionally rich food to protect them from infectious diseases (GOK, 1992). Therefore, with the high incidence of poverty in Kenya and food insecurity, it must be true that malnutrition is also apparently high.

Ndivisi location is one of the eight locations making up Webuye Division, which is part of Bungoma District. Bungoma is one of the administrative districts making up Western Province of Kenya. According to GOK (1994, 1997), the District is found in a high potential area especially Webuye Division. There is a high population growth rate in the District, of which 20.6% of the total population is made up of children between the age of 6 months-5 years. Thus, the high population density coupled with limited resources in the district is the major cause of poverty (GOK, 1994). The study was undertaken to determine whether feeding practices have an influence on nutritional status of pre-school children in Ndivisi Location, Bungoma District, in rural Western Kenya.

1.2: STATEMENT OF THE PROBLEM

The pre-school child has very different requirements from the school going child or the older child. This age group is vulnerable because of its total dependence upon a caretaker to provide all the basic requirements for nurturing. Among them, is the basic need for food.

According to UNICEF (1998), Protein Energy Malnutrition still remains a major health problem in Kenya and other developing countries among young children. However, this problem cannot be fully addressed without looking at some of the child feeding practices being undertaken at the household level that may lead to malnutrition.

For instance, though several scholars have advocated for weaning of infants to take place at between the age of 4 months and 6 months, (Hofvander, 1983; K'okul, 1991) some mothers either wean their children as early as when they are a few weeks old, while others delay until when the child is over a year. Periods of shortages of food also affect the number of times a child can feed in a day. Hence it is not unusual for families with young children to eat only once or twice a day. Whereas health officials and nutritionists heavily campaign for the use of a cup and a spoon for feeding young children, (Hofvander, 1983) it is still not uncommon to find mothers feeding their children using bottles even with heavy gruel's such as porridge.

Also, very few rural areas in Bungoma have a supply of clean water, thus having a great influence on the hygienic standards with which the food is prepared and administered to children. For instance, it was observed by K'okul, (1991) among the Samias that hygienic standards of child feeding were not high. Plates of food were shared with flies that had bathed in either filled latrines, human faeces or dead organic matter. Children were occasionally fed using a dirty calabash, cup or spoon.

Thus, these are not uncommon scenes in the rural areas where water has to be drawn from wells or boreholes, miles away from homes. Lastly, food taboos still exist in some areas of Bungoma District, which may have great influence on the types of foods given to Pre-

schoolers (Kuria, 1996). Thus these factors may have a great influence on the nutritional status of the pre-schoolers. The study, therefore, aims at finding out child feeding practices that may have an influence on the nutritional status of pre-schoolers.

The fact that most mothers spent most of the time away from home, indicates that children may be left under the care of their young siblings. The young children themselves being inexperienced in child care practices may not adequately meet the needs of the pre-school children.

1.3: PURPOSE OF THE STUDY

The study was carried out to determine the type of food given to pre school children, methods of food preparation weaning practices employed, and food taboos existing within Ndivisi location that may influence the nutritional status of pre-school children. Through the study it is expected to be established that socio-cultural and economic factors may have an influence on the type of food given to pre- school children and thus may affect their nutritional status.

1.4: OBJECTIVES

The objectives of the study included to:

1. Determine the nutritional status of preschool children.
2. Investigate the type of foods given to pre-school children.
3. Explore the methods used in food preparation and weaning practices used.
4. Identify the social, economic, cultural, and psychological factors that influence the nutritional status of pre-school children.
5. Establish the relationship between demographic characteristics and nutritional status of pre-school children.
6. Find out the breastfeeding patterns among mothers.

1.5: SIGNIFICANCE OF THE STUDY

The results of the study are expected to expose the real situation about the nutritional status of pre-school children in Bungoma District. Hence the findings will be useful to Non Governmental Organisations, Government Ministries such as the Ministry of health, and the Ministry of Culture and Social Services in their focus on preparing education packages for the mothers and their effort in improving the nutritional status of pre-school children. The study findings will also add to the wealth of knowledge available on childcare health and nutritional status. Lastly, the study can be useful in evaluating the impact of Nutrition Rehabilitation Programmes for pre-school children in Bungoma District.

1.6: LIMITATIONS OF THE STUDY

1. There was a language barrier. Though the researcher is a Bukusu, fluency of the language and translation of some of the words was a problem.
2. Some of the children were stubborn and thus refused to stand on the weighing scale.
3. During market days on Tuesdays, most mothers were unavailable forcing the researcher to make appointments for suitable days.
4. Some mothers expected to be given money in exchange for the information they were to give out.
5. Because of lack of funds better results would have been attained if a longitudinal study were carried out between harvesting period and times of food scarcity.

1.6: DEFINITION OF TERMS

Malnutrition: Pathological conditions brought about by inadequate or excess intake of one or more of the essential nutrients in comparison to the physiological requirements of the body.

Feeding practice: Denotes any activity or means by which the individual employs to procure food for the family and the subsequent feeding of the food to young children.

Child nutritional status: this refers to the physical condition of the child as influenced by the utilisation of the nutrients.

Under-nutrition: This refers to intake of food in inadequate amounts compared to the needs of the body.

Anthropometry: The measurements of body size and proportions in order to monitor normal growth and nutritional health in well nourished individuals as well as detecting nutritional inadequacies or excesses.

Cultural Practices of Food: The way of life of a people that determines the type of food eaten, the way it is prepared and in the context in which it is eaten.

1.7: CONCEPTUAL FRAMEWORK

This study was based on adaptations made from the SPEC complex model (e.g. K'okul, 1991; K'okul, 1998). The model is used to determine the casualties of food insecurity at the household level. According to the model, food insecurity is caused by acute food shortage/inavailability, ill health, and diseases, which result from contaminated water sources, poor sanitary conditions and poverty. It further elaborates that household characteristics may lead to food insecurity especially when people are poor, household incomes are low and household sizes are large.

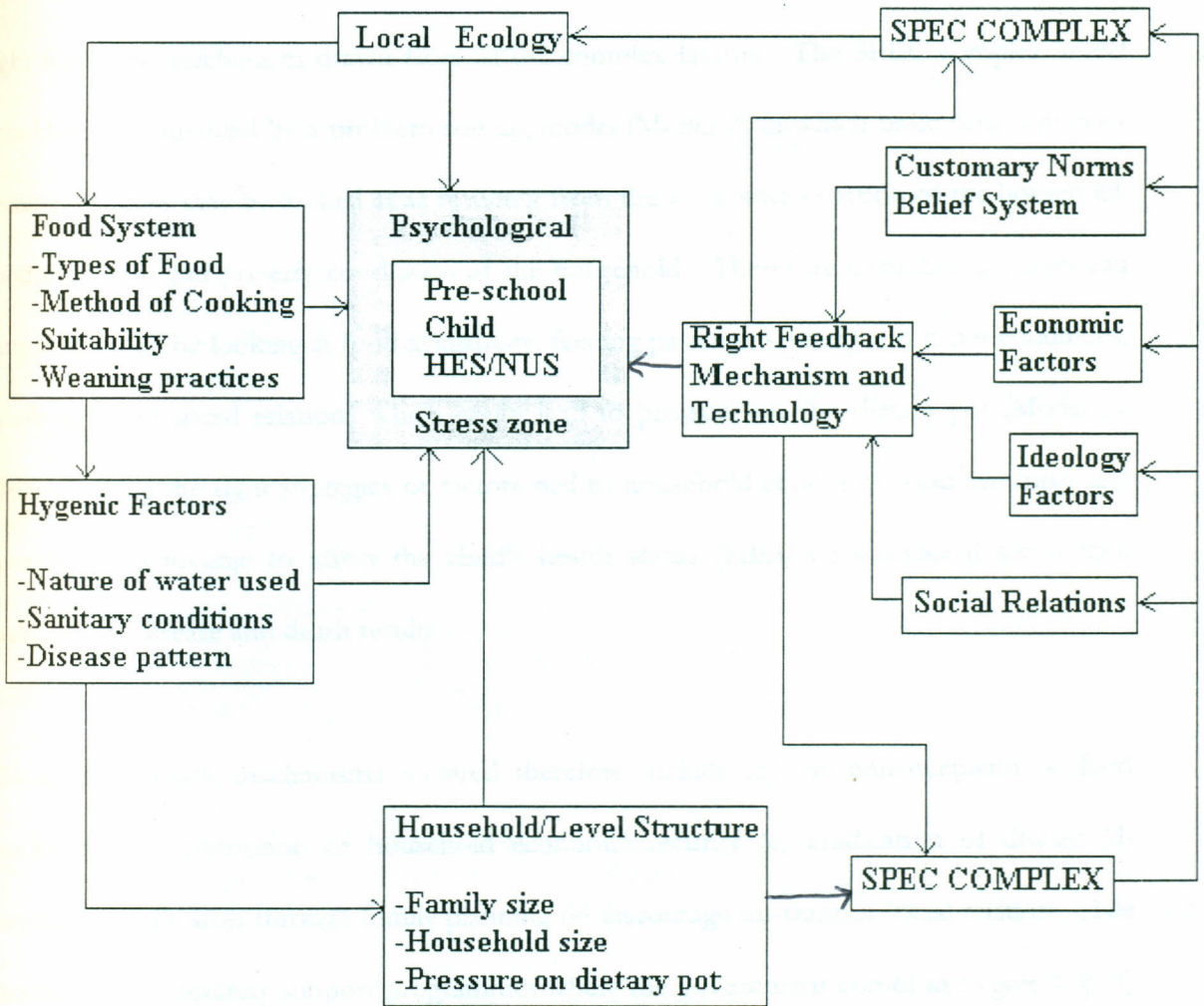
The model ascertains that factors determining promotive health status (HES) and Nutritional status (NUS) in the household are influenced by Social, Political, Economic and Cultural (SPEC) complex factors (Model 1). In this case, social factors such as kinship network and the

number of relatives staying in a household will determine the availability of food in terms of quality and quantity to individual household members which in this case is the pre-school child. Also, customary norms or belief systems will determine the type of foods given or prohibited from the pre-school child. Further, economic factors in terms of whether the family members are employed so as to provide income, and ownership of things like land will equally play a role in determining availability of food in terms of quality and quantity.

Apart from the SPEC complex factors, other aspects need to be addressed that may directly or indirectly affect the nutritional status of the pre-school child. For instance, at the household level the size of the family will play a role in determining the availability of food. If the family is large, then there will be pressure on the dietary pot. (K'Okul,1998). Also, food system is another issue that needs to be borne in mind. The type of food grown and given will determine whether the child grows up to be a healthy individual or not. This is because at the age of one (1) year to around five (5) years, there is rapid growth and development of the physical part of the child, which may be hampered if the right type of foods is not given. Relatively, the method of food preparation will determine whether the child can easily eat the food and hence affect digestibility.

Also it will determine hygiene practices employed and the mode of feeding to be used when giving the child food. Between the age of 6 months to 24 months it is imperative that weaning food has been or is being introduced to the child. If it doesn't take off within this age, then the rapid growth and development of the child can easily be interfered with.

Figure 1: Model 1 - Analysis of pre-school child feeding practices.

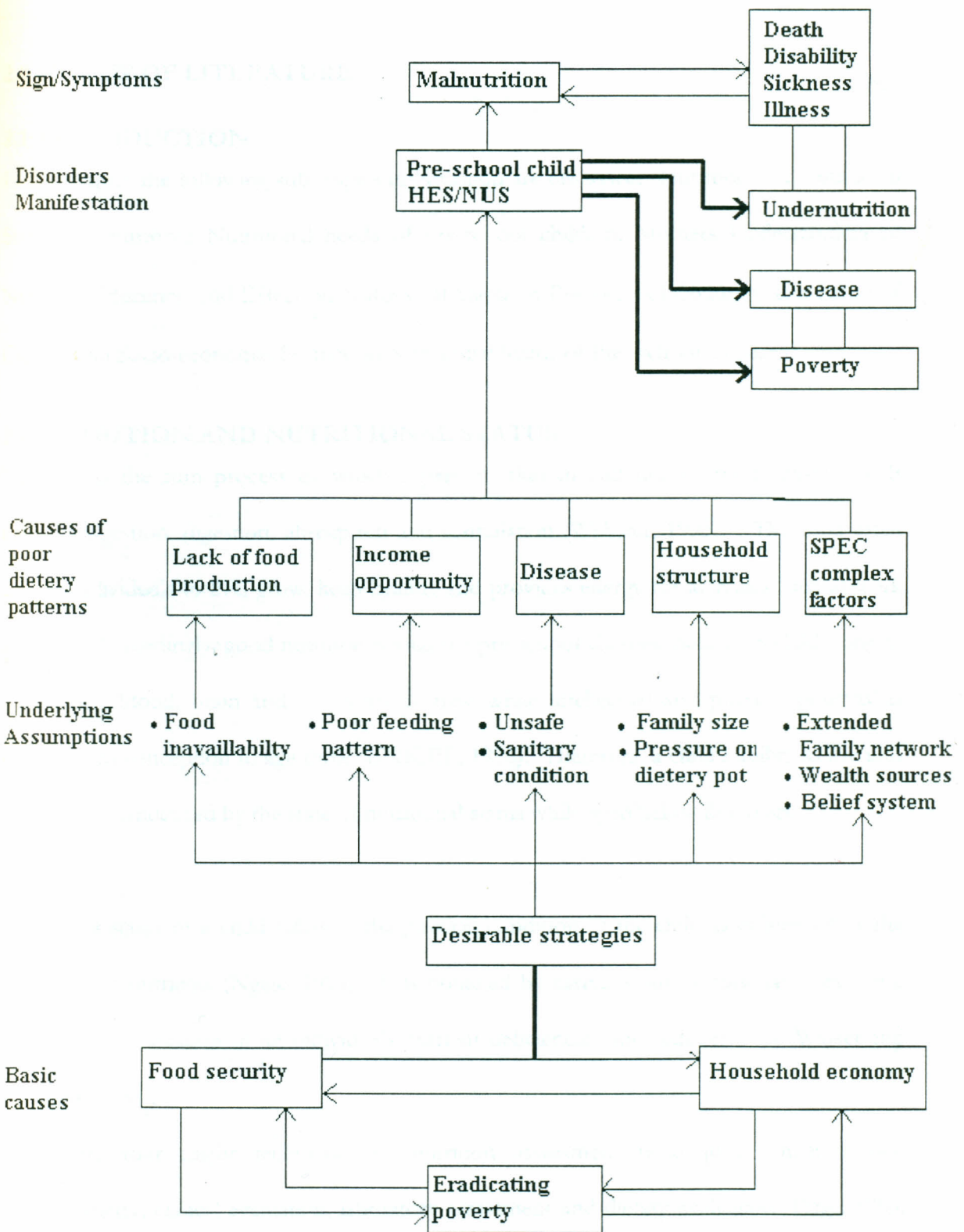


Additionally, hygiene factors need to be borne in mind as playing a big role on the nutritional status of the pre-school child. For instance, in some communities sources of water for household use are contaminated, or they lack facilities such as latrines, making the pre-school child vulnerable to diseases such as diarrhoea and/ or dysentery. With the presence of such illness, food given to the child cannot be utilised by the body, thus affecting its nutritional status.

All these work in a network like "a spiders web" to impinge on the health of the pre-school child which may lead to psychological stress, thus affecting health status (HES) or nutrition status (NUS) of an individual. When addressing the above problems, we must develop the right feed back mechanism drawn from SPEC complex factors. The SPEC complex model should be accompanied by a problem solving model (Model 2) in which basic causes of poor feeding practices may be looked at as resulting from the economic situation of the household, food insecurity and poverty conditions of the household. Therefore desirable strategies can only be attained by looking at food availability, feeding patterns, sanitary and water conditions, family size and social relations which could lead to pressure on the dietary pot (Model 2). Without taking the right strategies or factors tied to household economy, food insecurity and poverty that converge to affect the child's health status (HES) or nutritional status then malnutrition, disease and death result.

The right feedback mechanisms required therefore include (a) the enhancement of food production (b) promotion of household economic security (c) eradication of disease (d) control of family sizes through family planning (e) discourage un-wanton social relations while encouraging community support programmes where the government comes in to give help (f) empower people economically (g) discard "bad" traditional food practices and promote the good ones. Therefore, according to the problem-solving model, (Model 2), unless the right feedback mechanisms stated above are taken, malnutrition resulting in either sickness/illness, disability, and finally death will occur in society.

Figure 2: Model 2- Problem-solving model for poor child feeding practices.



CHAPTER 2

2.0 REVIEW OF LITERATURE

2.1: INTRODUCTION

In this chapter the following sub- topics in Nutrition are discussed. Nutrition and Nutritional Status; Malnutrition; Nutritional needs of pre-school children; Mothers Understanding of Nutrition Education and Effect on Nutritional Status of Pre –school Children; The Effect of Cultural and Socio-economic Factors on Nutritional Status of Pre- school Children.

2.1: NUTRITION AND NUTRITIONAL STATUS

Nutrition is the sum process by which a person takes in and utilizes food substances. It involves ingestion, digestion, absorption and assimilation (Webster, 1993). The food eaten enables individuals to live, grow, keep healthy and provides energy for activities such as work and play. Accordingly, good nutrition is vital for pre-school children because a child's organs and tissues, blood, brain and bones are formed while intellectual and physical potential is shaped from conception to age three (UNICEF, 1998). Therefore, a child's ability to live into the future is influenced by the state of nutritional status while aged below five years.

Nutritional status of a child refers to the physical condition of the child as influenced by the utilization of nutrients (Ngige, 1993). It is obtained by carrying out Nutritional assessment, which is the evaluation of an individuals nutrient deficiencies and requirements (Walker and Hendrick, 1985).

There are four major techniques of nutrition assessment techniques, which include anthropometry, clinical evaluation, laboratory assessment and dietary evaluation (Paige, 1988;

Brown, 1990; Walker and Hendrick, 1985). Among these, anthropometric measurements of body size and proportions are often used because it provides a rapid and quantitative means of nutritional assessment. It is especially useful to children in whom deviations from standard references determine abnormalities in growth and development that may have resulted from nutritional deficiencies or excesses.

According to UNICEF, (1992); Paige, (1988); Walker and Hendrick, (1985); there are three major indicators of nutritional status by use of anthropometry, which are height for age, weight for age and height for weight. Height for age measures linear growth and indicates chronic under-nutrition. Accordingly, children falling below 90% of the median or National Center for Health and Statistics (NCHS) reference population are considered short for their age and are said to be stunted. This condition is often associated with long term factors such as poverty, frequent infections and poor feeding practices.

On the other hand, weight for age indicates acute or current under-nutrition. Children falling below 80% of the median score of the WHO/NCHS reference population are considered to be under-nourished and are said to be wasted. Short-term problems such as reduced food intake or recent episodes of illness may cause this condition.

Lastly, weight for height is a composite measure of both stunting and wasting and this condition applies to children who fall below 80% of the median score for the WHO/NCHS reference population. Additionally, height for age is a more useful tool for evaluation of acute and chronic malnutrition.

According to the “ The Fourth Child Nutritional Survey of 1987, carried out by the GOK” The national mean of H/A was estimated at 95.6% with about 20% of the children stunted, that is, falling below 90% of the reference population. Mean weight for Height stands at 101cm with 2.5% falling below the cut off point of 80% Weight for height of reference population. Lastly, 18% of children had weight for height index below 80% of the reference population.

2.2: MALNUTRITION

Malnutrition is a pathological condition brought about by inadequate or excessive intake of one or more of the essential nutrients in comparison to the physiological requirements of the body (Tumwet, 1996). Several studies carried out have been able to show that malnutrition, as a disorder still remains a big global problem. All in all, the exact figures are hard to bring out because only 1% or 2% of the worlds children exhibit visible signs of malnutrition (UNICEF, 1994). However, an estimated 190 million children under age five are chronically malnourished, thus susceptible to ill health and development. Though the figures look glaring, gloomier pictures could be exhibited considering that most malnourished children die of other ailments, thus evading the real figure. The situation is even worse in developing countries where it is estimated that 40% of the children under five suffer from acute to chronic malnutrition (UNICEF, 1998)

There are different types of malnutrition, which are categorized on the basis of severity or the type of foods which individuals are deprived thus leading to malnutrition. For instance, WHO, (1981), and Walker and Hendrick, (1985), distinguish two types of malnutrition, collectively referred to as Protein Energy Malnutrition. In this category, there is Marasmus, which occurs after severe deprivation of both proteins and calories. It is characterized by

growth retardation wasting of muscles and subcutaneous fat and distention of the abdomen because of the weakening of the abdominal muscles. Though hair may look normal in colour, it often looks sparse. Marasmic children are often aged between 6 and 24 months. Another type of protein energy malnutrition is kwashiorkor in which case protein deficit exceeds the calorie deficit. Stress or inadequate intake of calories causes lack of protein. The swelling of the forearms, hands, legs, and feet evidences kwashiorkor. The face, abdomen and genitals may also be swollen. Children are often irritable and they lack interest in their surroundings. The skin is often pale and may form lines or cracks. The hair for some children may be pale, brownish, orange or blonde.

Further studies by K'Okul, (1991); WHO, (1981) have been able to show the existence of both Kwashiorkor and Marasmas in a victim, in which case it may be referred to as marasmic kwashiorkor. Wasting of muscles and bones standing out at the upper arms, shoulders and chest often evidences this.

Another study carried out by K'Okul (1991), among the Abasamia of Western Kenya shows the existence of two types of malnutrition, notably cultural marasmas or "*chira*" and kwashiorkor or "*akuodi*". "*Chira*" results from acute starvation in small children, fed on a diet deficient off enough energy to fill the requirements of a rapidly growing child. On the other hand, "*akuodi*" is a severe disorder of young children caused by chronic deficiency of protein and calories in the diet and characterized by stunted growth, oedema and a protruding belly.

2.3: NUTRITIONAL NEEDS OF PRE-SCHOOL CHILDREN

All persons in life need the same nutrients though in varying quantities. The amounts needed depend on the age, sex, size, activity, specific conditions of growth and the state of health

which is more often than not altered by environmental stress (Hui, 1985). For instance it has been emphasized by Ngige, (1993) that deficient intake of vital minerals, vitamins, essential fatty acids and micro-nutrients may lead to health problems especially during periods of growth, pregnancy, early childhood and lactation. Furthermore, a population with a low calorie intake and protein has an equally low output leading to poor production and ultimately poverty. Therefore, good nutrition is essential for healthy development of individuals, families, and societies and it helps overcome health problems especially among women and children in relation to chronic and degenerative diseases. After an infant is born, there should be exclusive breastfeeding for the first four to six months (UNICEF, 1998; Hofvander, 1983; Paige, 1988). This is because it has been universally proved that breast milk contains all the nutrients, antibodies, hormones and antioxidants that an infant needs to thrive. It also plays a pivotal role of promoting the mental and physical development of children.

Breastfed infants not only show better immune responses to immunizations, but the intake of breast milk also protects the mucous membranes that line their gastrointestinal and respiratory tracts, thus shielding them against diarrhoea and respiratory tract infections. Hence, it has been observed that infant mortality rates are high or moderately high for bottle-fed infants in poor communities where they are 14 times more likely to die from diarrhoeal diseases and 4 times more likely to die from pneumonia than a baby that is exclusively breastfed. Also, breast milk has long chain fatty acids, which aid in cognitive development. It also has fewer infections, which make breastfed infants to have greater interest in their environment thus learn faster than ill infants.

Where breastfeeding fails to be established, bottle-feeding is another mode of feeding given to children (Hofvander, 1983; Hofvander and Cameroon 1983; Passmore and Eastwood, 1986; Anderson, et al, 1983). Infant milk formulas are prepared by manufactures from the products of their dairy industry to which are added lactose and vegetable oils and sometimes other carbohydrates and fats. Whole or skimmed cow's milk are common basic ingredients, but whey is much more used (Passmore and Eastwood, 1986). However, in the recent past, many nutritionists and healthcare workers have expressed their concerns about bottle-feeding practices in third world countries (Hofvander, 1983; Hofvander and Cameroon, 1983; Passmore and Eastwood, 1986). The bone of contention has been that most parts of third world countries do not have clean water sources, fuel, and boiling water facilities essential in the preparation of infant formulas, complimentary baby foods and at the same time clean utensils before and after use. Hofvander and Cameroon, (1983) add that there may be difficulties in preparing feeds of the correct concentrations because of poor labeling if the language used is foreign, the drawings are too small and in other cases the writings may be useless to an illiterate mother. The measuring scoops may be awkwardly shaped while in other circumstances mothers may be confused about which formula to pick on as there is a wide range on the market. After four to six months a child needs to eat other foods besides breastmilk.

There is a lot of emphasis on the introduction of solid food to children when they attain the age of four to six months (Paige, 1988; UNICEF, 1998; Arke, 1989; Lutz, 1988; Alnwick, D., et. al, 1987). A child needs to be fed frequently with energy rich, nutrient dense foods. The process is referred to as weaning. However, giving other foods before the child is four months may make the infant vulnerable to diarrheal diseases and it reduces the frequency and

intensity of sucking, thus reducing the flow of breastmilk (Arke, 1988). For instance, the introduction of cereals and vegetables can interfere with the absorption of breast milk iron, which is normally low in concentration but high in absorbability. Since iron balance is extremely delicate in the young infant, this can result in iron deficiency and anaemia. Other observations by Paige (1988) show that prior to four months of age the infant is not developmentally ready to handle solid foods while neuromuscular control is poorly developed. Additionally, salivary, gastric and intestinal secretions are not yet produced in sufficient quantity to metabolise these foods effectively.

On the other hand, delaying the introduction of solid foods beyond six months of age may lead to insufficient intake of calories and other nutrients (IBID). A study carried out by Kamau, (1994), on Childcare Practices And Nutrition status of children 0-2 years in Thika, it was found out that 58.3% of the mothers interviewed indicated that they had weaned their children between the age of 2-4 months, 24.2% had weaned their children when they were 0-1 months, while 14.4% when they were 5-6 months old and 3.0% when the children were more than 6 months old. Hence, with time, periods of weaning of children in Kenya keeps going down and especially in urban areas where people are often faced by time constraints.

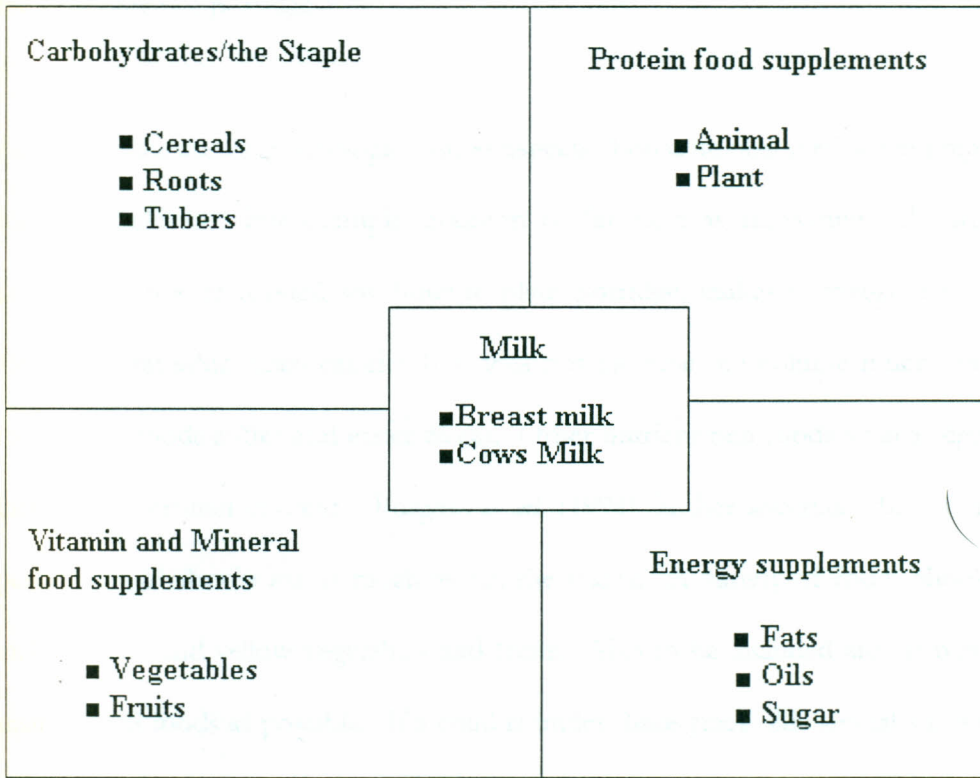
When carrying out weaning practices, a lot of emphasis needs to be placed on the type of food in terms of nutrient content, which a child is given. There is need to realize that within the first months of a child's life, protein comes to him through his mother's milk, but from the age of six months onwards, he must have plenty of other protein foods added to his meals in addition to breastmilk (Lutz, 1988; Hofvander, 1983).

The first foods need to be soft and without strong spicy flavours. The staple diet or cereal in the community should be used to make the first food for an infant. Other foods that can be included in the diet are legumes, potatoes, mashed fruits or vegetables. However, the vegetables should be soft, without fiber or mashed while fish and meat should be finely chopped.

Hofvander, (1983); and Hofvander and Cameroon, (1983), Stipulate that the simplest recipe for weaning food is one which only has two ingredients, that is a cereal or root mixed with a protein either of animal or plant origin. This may be referred to as a basic mix. Recipes which are more suitable for the weaning period, and for feeding later are called multimixes. A multimix has four basic ingredients. A staple as the main ingredient, preferably a cereal, a protein supplement from a plant or animal food, a vitamin and mineral supplement and then an energy supplement. The simplest method of planning a multimix diet is to use a food square, thus represented below in Figure 3.

However, studies carried out have been able to show that weaning foods made from the major staple foods in the region have a low nutrient density because of unmodified starch and they are low in fat (Alnwick, D.,*et. al*, 1987). This means that when porridges are made, a child must consume large quantities to attain required energy and nutrients. On the contrary, many children eat such quantities resulting in insufficient intakes of energy, protein and other nutrients. The problem is exacerbated if children are fed infrequently because of other demands on mother's time or if the appetite is reduced because of illness.

Figure 3: FOOD SQUARE (Adapted from Hofvander and Cameron 1983)



To improve the nutrient intake of weaning age children, technologies have been devised that increase nutrient density of weaning porridges and reduce the risk of infection (Alnwick, D., *et. al*, 1987; Hofvander and Cameroon, 1983; Burgess *et. al*, 1994; Ngesa, *et. al*, (1989). They include germination and fermentation. In this regard, when a small quantity of germinated flour rich in enzyme amylase is added to thick cereal porridge, it is known to reduce dramatically the viscosity of such porridges, allowing for the preparation of a more nutrient dense food that is sufficiently liquid for a young child to consume. On the other hand fermentation process makes available nutrients such as proteins, vitamins and minerals. It also preserves porridges and makes them resistant to contamination by inhibiting the proliferation

of diarrhoea causing microorganisms. Thus, young children can be fed more frequently using the same batch of porridge.

Apart from the above technologies, other aspects should be observed when preparing weaning food for children. For example, addition of fat such as margarine, oil, fatty legume like groundnut flour or roasted soy flour to plain porridge, makes it energy rich (Burgess *et. al*, 1994). The fat adds many calories but does not increase the volume much. Fatty foods also make bulky foods softer and easier to eat. Other nutrient rich foods such as eggs or soy flour increase the protein content. Burgess *et. al*, (1994) further ascertain that after the weaning period, a child should eat as much as he/she wants. A variety of foods should be given to include green and yellow vegetables and fruits. Also to be included are fat rich foods and as many animal foods as possible. If a child is under three years old, several snacks a day should be given. As the child gets older his/her appetite increases and she can eat more food at each meal. Also, his/her food needs for each kilo of weight are less, so she may not need to eat more frequently.

According to a study by Kamau, (1994) on Child Care Practices and Nutrition Status of Children Between 0-2 years in Thika, it was found that most weaning foods used were mashed fruits, that is, papaws and bananas, maize meal, and mashed vegetables such as potatoes, spinach and cooked bananas. On another study, Ngige, (1993) in rural Thika, established that only 5% of the pre-school children consumed diets which complied with the quality level of the three main food group patterns of proteins, carbohydrates and vitamins. In this case, the most limiting foods were those of the body building or protein foods, and the protective foods

or the fruit and vegetable group. This could be attributed to the fact that these foods cost more compared to those of the carbohydrate content.

In another study carried out by Geuns *et. al*, (1991), in Nyanza province of Kenya on Child Nutrition in the Pre-harvest season, it was established that the first dish to be introduced to a child as weaning food is “Nyuka” which is thin porridge made of maize meal flour, with milk (fresh or sour) and sugar being optional ingredients. In other cases fried eggs may be given because of their soft consistency. It was also observed in the study that consumption of foods such as roots, tubers, and starchy fruits is low, while that of legumes and fruits was almost negligible. Additionally, the study established that children in Nyanza eat three meals in a day, which are made up of breakfast, lunch and supper. Snacks are also given in large quantities. After three years of age, the daily diet of children resembles that of adults except for the amounts consumed and by that time the children will be eating from the family pot.

2.4: THE EFFECT OF HYGIENIC STANDARDS ON THE NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN

The impacts of food programs on the nutrition and health status of individuals are mediated positively and negatively by different characteristics (Sahn and Scrimshaw, 1984). For instance, if sanitary practices regarding food preparation and storage in the home are poor, then food eaten will lead to morbidity. Ngesa, *et. al*, (1989) emphasizes the fact that, where sanitation is poor, opportunities for food contamination are abundant. Raw ingredients, water, feeding bowls, utensils, and hands are all potential vehicles through which diarrhoea pathogens can be introduced into food. Alternatively, if food is allowed to stand in high ambient temperatures after being prepared (due to lack of refrigeration facilities, fuel and mothers time needed to

reheat foods) there's is high multiplication of pathogenic bacteria which will increase the risk of diarrhoea in the young child. Ngesa *et. al*, (1989) further ascertains that where complimentary feeding among children was started at three months of age, enterobacteria coli were found in the faeces at the level of upto 10^4 bacteria per gram. The counts increased after storage of the food for periods as short as three hours.

In many cases, diseases and infections in the community are caused by unclean water and/ or poor sanitation (Lutz, 1988). Water born diseases are transmitted through the faecal oral route especially if faeces of a sick person contaminate drinking or cooking water. This is because water from the community is attained from natural sources such as springs, rivers, swamps or stored rainwater. It may thus lead to diseases like cholera, diarrhea, typhoid, anaemia, dysentery, polio and hepatitis A. Alternatively, diseases can be spread from a latrine too close to a water source, be it a well or a spring, a stream or a pond which enables micro- organisms to sip into the liquids from the latrine and into the water supply.

Therefore, clean water is very essential to human life. This is because healthy families, make water safe for drinking , they use enough water for personal hygiene and they prevent contamination of foods and water through the use of latrines.

2.5: THE EFFECT OF CULTURAL AND SOCIO-ECONOMIC FACTORS

ON THE NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN

Culture may be looked at as a way of life of a people. It encompasses the complex whole, which includes knowledge, beliefs, art, morals, law, customs, and any other capabilities and any habits acquired by man as a member of the society (Fieldhouse, 1995). In this regard food

habits are a part of this cultural heritage. Since culture is learned, food habits acquired early in life and established, are likely to be long-lasting and resistant to change. There is, therefore, a need to develop sound nutritional practice early in a child's life as basis for life long healthy eating. Hui, (1985) adds that food selection is an individual action influenced by social and cultural sanctions. Further suggestions by Fieldhouse, (1995) are that foods chosen, methods of eating, preparation, number of meals per day, time of eating and size of the portions eaten make up human food ways and are an integrated part of a coherent culture pattern in which each custom has a part to play. Culture has a value system. Dominant values will influence all aspects of related activities as well as the specific way specific foods are viewed.

Krause and Mahan (1984) exemplify that different substances of a culture may be accepted as food of which some are labeled good and some bad. Occasionally, bad foods are sometimes highly desired as in the empty calories sometimes called "junk" foods. Further, modes of food preparation may be influenced by one's culture. In this case, whereas one-pot dishes are used by one culture others prefer using different pots for different age groups of the members of the household. Additionally, whereas some cultures may prefer roasting and baking as modes of cooking, others may desire and use alternative methods. Alternatively, for some communities' social status determines the type of food different members of a community are given. For instance, Krause and Mahan, (1984) observe that whereas in primitive tribes pregnant women are given the most favourite foods in anticipation that a warrior might be born. In other cultures pregnancies require food restrictions which are often foods beneficial to the mother.

Relatedly, a study carried out by Kuria, et al (1996) was able to show that there is still an existence of food taboos in Bungoma District which if strictly adhered to may have a big influence on the feeding practices of pre-school children and thus their nutritional status. An example of prohibited foods, to which they are restricted and reasons for prohibition are given below:

Food Prohibited To Children	What Would Happen If Eaten
Eggs	Delayed talking, Delayed teething
Cassava /Sweet/potatoes	Child will grow a big stomach
Meat/ Vegetables	Child becomes greedy and demanding
Fish	Child salivates a lot
Papaw	The body will swell
Fermented Porridge	The body will swell
Ripe bananas	The body will swell
Beans	Delayed walking
Milk and Water to a child with measles	The child will not be healed

Another study by K'Okul (1991) among the Samias of Western Kenya was able to exhibit the fact that religion, superstition and food taboos are still high in existence and thus influence what is eaten. For instance, people do not eat certain wild green vegetables such as "Lisaka" (*Gynandropsis gunanandra*) and mushroom, which are greatly believed to grow in deserted homesteads (gundni).

Relatedly, some foods were consumed cold or hot because of the attached cultural values or perceived functions to the body. For instance, there are individuals who would not accept

cold food, believing that it would cause chilies, constipation, nausea, vomiting, heartburn (typical of pregnant mothers), stomach ache and /or diarrhoea. Such food would be withheld from children believing that it induces extended belies and worms. Other factors include beliefs in witchcraft and food poisoning which is very pervasive. In this case toddlers and breastfeeding infants are the most vulnerable groups.

2.6: SOCIO-ECONOMIC FACTORS THAT AFFECT THE NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN

The household in most societies is a primary setting for the acquisition, preparation, distribution, and consumption of food (Sahn, and Schrimshaw, 1984). Hence, household composition and organizations should be regarded as an intervening or confounding condition affecting the impact of nutrition and health interventions. Additionally, it is the primary social and economic unit. Until quite recently, the household in many societies was the primary unit of production as well as consumption. However, industrialization, urbanization and the impact of these processes on rural communities is bringing about rapid changes in the production and consumption relationships in households. Nonetheless, the household remains a fundamental social unit in all societies. Furthermore, WHO and FAO, (1992) observe that since incomes provide the major means of having access to food, persistent unemployment or underemployment prevents groups from achieving good nutritional status. The landless for instance have no way of obtaining their food needs from working on their own land. Based on household income expenditure survey of 1982, it was found that more than 20% of the rural households in Kenya do not have enough income to afford a basic adequate diet to meet their nutritional needs and, therefore, suffer from what can be called food poverty. Other studies carried out by Mwanthi, (1990) in Peri-urban Nairobi on Maternal

Attributes And Food Practices in Households With Malnourished Children And Well nourished Children below five years, found that purchasing was the most common mode of attaining food as households in Peri-Urban areas have no space for cultivation. Thus well-nourished households had higher purchasing frequencies for food compared to malnourished households. Well nourished households also ate a more diverse diet and thus bought higher quantities of beans, milk and sugar which are good contributors of protein and energy and relatively more varieties and higher quantities of vegetables. They also have more snacking which could have contributed to the improved nutritional status.

Another study carried out by Waudu (1993) on Mothers Understanding and Use Of Nutrition in Peri Urban Nairobi, was able to expose the fact that mothers understood nutrition but were unable to use that knowledge to feed their families because of poverty. The social and economic factors that influenced their understanding and use of nutrition were poverty, unemployment, illiteracy, poor sanitation, and housing environment. Hence, the study concludes that nutrition status will not be improved by nutrition education alone but by improved incomes, good sanitation and empowerment of mothers.

2.7: MOTHERS UNDERSTANDING OF NUTRITION EDUCATION AND EFFECT ON NUTRITION STATUS OF PRE-SCHOOL CHILDREN

There have been many of research works which have been going on to establish whether mothers knowledge of nutrition has a role to play in the nutrition status of pre-school children. However, GOK, (1994) has only highlighted the fact that a mothers level of education is associated with their children's nutritional status. For instance, studies carried out have been able to show that early childhood mortality rates are higher for children of women who have

no education and those who have not completed their primary education. On the other hand, children born to mothers who have some secondary level of education are half as likely to die before the fifth birthday as those born to mothers who have no education or have not completed their primary education. This could be attributed to the fact that educated mothers are more likely to use the available health services and have greater knowledge of nutrition, hygiene and other practices related to childcare. Related studies carried out by Waudu, (1993) were able to show that mothers had an understanding about nutrition though they were unable to use the knowledge because of poverty.

CHAPTER 3

3.0: METHODOLOGY

3.0.1: INTRODUCTION

This chapter will give a description of procedures that were used in carrying out the study. It will include the description of the study area and justification for the selection, research design, target population, sample size and sampling procedures, instruments for data collection, data analysis, and piloting of the instruments.

3.1: STUDY AREA

The study was carried out in Ndivisi Location, Webuye Division, Bungoma District. Bungoma District is one of the six districts making up Western Province of Kenya. It lies between the altitude of $0^{\circ} 25.3'$ North And $0^{\circ} 53.2'$ North and Longitude $34 21.4'$ East and $35 0.4'$ East. It covers an area of 2063 square Km., which is about 25% of the total area of the province. According to GOK, (1996) 1994-1996 Development Plan, Agriculture is the base of the economy accounting for 75% of the income earning activities in the District. The major food crops include maize and to a lesser extent sugarcane which also acts as a major cash crop in the area. In the recent past, there have been significant nutritional problems, which have been attributed to relatively poor soils, low food production per unit area, high population, pressure on the land and allocating large percentage of land to cash crops especially sugarcane.

According to the GOK (1997) Development plan, by the year 2001 the population of the District is projected to be 811,389 up from 571,445 in 1989. Hence, the population growth rate is estimated to be 1.9%. Nutritional survey carried out in 1992 shows that on average

Bungoma District has 17% of under fives exhibiting mild Protein Energy Malnutrition and 6% exhibiting clinical malnutrition (GOK, 1994). The report further shows that the poor in Bungoma District are to be found among small holders, landless, migrant farmers and urban dwellers. The poor small landholders have less land, lower inputs, non-farm incomes and lower education levels. All these have had a great influence on the nutrition status of children below the age of five years. Thus, the (GOK, 1997) development plan, depicts infant mortality rate as standing at the glaring figure of 78 deaths per 1000 live births. This is above the provincial rate of 63.5 deaths per 1000 live births and the National average estimated at 62.5 deaths per 1000 live births. Notwithstanding, the proportion of children who are stunted in rural Bungoma is 41% while the National average is 33%. Wasting is also a major problem, as 33% of children under five years were wasted in 1995.

It is with this in mind that a study was undertaken to determine whether child feeding practices have an influence on nutritional status of Pre-school children.

3.2: RESEARCH DESIGN

The study employed both qualitative and quantitative research designs. A cross-sectional descriptive survey was used to allow for extensive collection of both qualitative and quantitative data. Survey deals with a phenomena as it exists in nature or society. Survey aims at providing accurate information about a phenomena (Toulitias and Compton, 1988).

Participant observation methodology was also employed. The researcher stayed with the study population for approximately one month during which she discretely observed the sampled population for purposes of the study.

3.3: SAMPLE SIZE AND SAMPLING PROCEDURE

The study population included all children within Ndivisi location between the age of 6-60 months. Ndivisi location has two sub- locations, Sitabicha and Magemo (Maasai). Sitabicha sub-location has 17 villages while Magemo sub- location has 8 villages. Cluster sampling method was used, whereby the area of study was divided into villages. Afterwards all the villages from Sitabicha sub-location and Magemo sub-location were listed and numbered. Four villages from each sub-location were randomly selected for purposes of the study. Then all children between the age of 6months-5 years were purposefully selected for the study, except for those households in which accessibility was a problem. The total sample of households studied was 100. Additionally, snow-ball sampling procedures were also incorporated to determine homes with children between 6 months and 5 years (60 months). The total number of children whose measurements were taken was 119.

3.4: DATA COLLECTION

Data collection was done using an interview guide, and observation checklists. Also, other data collection tools were the bathroom scale, the tape measure, and health cards, which were used to measure, weight, height and age. The data collection process took one month. The two research assistants were useful in trying to identify homes with children falling within 6- 60 months of age. They were also useful in creating a friendly atmosphere with the mothers. This is because in this community people are very superstitious about strangers handling their children. They say they might look at their children with bad eyes and this may cause them to fall ill. In cases where the mother of sampled households could not be found there was the necessity to book an appointment for an appropriate moment. These was especially common on Tuesdays when mothers went for market days at Kamukuywa.

3.4.1: Data Collection Tools

Weight Measurement.

This was taken using a bathroom scale, which was calibrated before and after each measurement. The weights were taken to the nearest 0.1Kg. Children were measured nude without any clothing. Two measurements for each child were taken for accuracy.

Height Measurement

The heights of children between the ages of 6 - 60 months of age were measured to the nearest 0.5cm using a length board and a tape measure. During the procedure the younger children were made to lie down while those above two years were measured standing. They were required to remove their shoes. Measurements were taken with an assistant to ensure the head was in contact with the headboard and that the legs were fully extended. Two measurements were taken to ensure accuracy.

Child Health Cards.(These were used to verify the child's age)

Interview Guide

There were two sections of the interview guide. One was used to collect general information about the mother/caretaker while the other was used to collect information about the child. Data was collected from the respondents using an interview schedule that contained both structured and unstructured questions. The interview method was chosen on so as to get an in-depth understanding of the situation. The interview method was carried out in the local language, which is Kibukusu. Services of two research assistants were sought who were conversant with the local language. Before the start of data collection procedure, the research assistants were trained in several areas such as sampling methodology, administration of the interview questionnaire, how to identify children below five years from information given by their mothers, then tally it with hospital cards or if the mother could not remember, attach it to

important events. The research assistants were also trained on how to take anthropometric measurements. The interview guide was written in English then translated to *Kibukusu* after which the answers were transcribed.

Two observation checklists were used to collect data on sanitation and information on General appraisal of the quality of the house.

3.5: PILOTING

Piloting of the instruments was done in Mukuyuni village to improve its efficiency in data collection. It was done to help improve the familiarity of the researcher with the instruments to be used for data collection. It was used to improve on the clarity of the questions and comprehension by both the enumerators and the respondents. Additionally, piloting was useful in establishing the time taken in administering an interview schedule in each household. Data for piloting was collected from ten respondents of similar characteristics as the study population but who were not included in the final sample. From piloting questions, which could not elicit the right responses, were removed from the interview guide.

3.6: DATA ANALYSIS

3.6.1: *Quantitative data*

Descriptive statistics such as frequencies, percentages, and means were used to organize and summarize numerical data on socio-economic and demographic characteristics of the respondents. Pearson Moment Correlation Coefficient was used to establish factors that significantly relate to nutritional status of pre-school children.

Information on the nutritional status of pre-school children in terms of weight for age (W/A) height for age (H/A) and height for weight (H/W) was analysed by basing on data from the National Center for Health and Statistics (NCHS) reference for pre-schoolers (WHO, 1983).

3.6.2: *Qualitative data*

Qualitative data was analysed using the following mode.

- ❖ **Coding:** This was done by assigning numbers or symbols to variable categories.
- ❖ **Pattern coding:** This was done by reducing large amounts of data into smaller sets, after attaining common themes from the answers given. This enabled unnecessary load to be deleted or left out.
- ❖ **Memoing:** This was done by tying together different pieces of data into a categorized cluster then putting on foolscap and filling them in a patterned order. This was useful in identifying and isolating those variables that depict instances of a general concept in order to avoid repetitions.
- ❖ **Display format:** It was used to compress and order data to permit coherent inferences.
- ❖ **Drawing and verifying inferences:** It was done to draw meanings from a particular configuration of data under each sub-heading in the display by noting patterns, themes and making contrasts and comparisons and reaching conclusions.

3.7: OPERATIONALISATION OF VARIABLES

3.7.1: *Dependent variable*

Nutritional Status: This was taken to mean the general state of health of children

between the age of 6 months-5 years in reference to how food is used. Nutritional status was determined through anthropometric measurements taken in terms of height, age, and weight.

3.7.2: Independent variables

Children's age: This was established by asking the mother the age of the child and then tallying it with that on the hospital cards.

Income: It was taken to mean the amount of money accruing from different sources such as salary or farm produce etc, that the family receives at the end of the month. It was measured in terms of Kenya shillings.

Wealth: This was determined by the number of livestock seen in the homestead or seen to be grazing out, and type of housing materials used.

Occupation: This referred to any form of paid employment carried out by the respondents.

Household size: This variable was determined by asking the number of relatives, friends, and children living and eating in the same house.

Dietary Intake: Children's diet was evaluated in terms of qualities of foods eaten at different meal times, for instance proteins, carbohydrates, and fats

Height: This referred to how tall the respondent was while standing upright or while lying on the measuring board. Children above two years of age were expected to stand straight, without shoes and to look straight. Children younger than two years of age were measured lying on a wooden length board.

Weight: This referred to how heavy a child was. The measurements were taken in Kilograms using a standard weighing bathroom scale without clothes.

Hygienic Practices of food preparation: This was determined by finding out where water for cooking is drawn, the presence or absence of a latrine, proximity of the latrine to the kitchen, and the presence or absence of a drying rack for utensils.

Cultural Practices of Food: This was determined by finding out foods avoided by the respondents because of cultural beliefs and norms.

Education: The respondents were asked the number of years of regular school they had completed

CHAPTER 4

4.0: RESULTS

4.1: DATA ANALYSIS AND INTERPRETATION

4.1.1: Introduction

The following were the objectives of the study.

1. To determine the nutritional status of pre-school children
2. To investigate the type of foods given to pre-school children.
3. To explore the methods used in food preparation and weaning practices carried out
4. To identify the social, economic, cultural and psychological factors through child care practices carried out, that influence the nutritional status of pre-school children.
5. To establish the relationship between demographic characteristics and nutritional status of pre-school children.
6. To find out the breastfeeding patterns among mothers.

4.1.2: Composition of the data

Data collection was purposively carried out among households with children between the age of 6 -60 months. The study population included 100 households in Ndivisi Location, Webuye Division, Bungoma District in rural Western Kenya. Additionally, anthropometric measurements of 119 children were taken.

Ndivisi location is made up of two (2) sub-locations, Sitabicha and Magemo. Sitabicha Sub-location has seventeen (17) villages; while Magemo (Maasai) Sub -location has eight (8) villages.

In each Sub-location all the villages were given random numbers after which four villages in each Sub- location were selected for the purpose of the study.

In Magemo Sub-location the villages selected included Misemwa, Nakalira, Kamukuywa and Wamono. On the other hand in Sitabicha Sub-location, villages selected on included Mukuyuni, Bilibili, Mfupi and Shandumba. (Table 1)

Table 1 Sampled Population in Ndivisi Location.

No of households: 100

SUB-LOCATION	VILLAGE	SAMPLED HOUSEHOLDS DEMOGRAPHY BY SEX					
		MALE		FEMALE		TOTAL	
		No.	%	No.	%	No	%
MAGEMO	Misemwa	1	1	11	11	12	12
	Nakalira	2	2	11	11	13	13
	Kamukuyua	3	3	10	10	13	13
	Wamono	0	0	12	12	12	12
SITABICHA	Mukuyuni	1	1	12	12	13	13
	Bilibili	0	0	12	12	12	12
	Mfupi	1	1	12	12	13	13
	Shandumba	0	0	12	12	12	12
	TOTAL	8	8	92	92	100	100

In each sub-location fifty (50) households were selected for the study. Purposive sampling method was used, whereby only households with children between the age of 6-60 months were selected for the study. Hence 100 households in the whole location were sampled for the purposes of the study. In the sampled households anthropometric measurements of 119 children were taken

4.1.3: Household characteristics

In the sampled households a total of 92% female and 8% male were interviewed (Fig 4). Of the households sampled, 97% stated "household head alive", while 3% had household head dead. In this case the household head was usually the husband, while in other cases it was the lady if she happened to be single. The spouse was taken to be the wife of the household head. There was need to find out the relationship between the respondent and the household head. From the responses, 84% were spouses of the household head, while 9% were household head himself/herself. Only (7%) of the respondents were either a relative of the household head or a close neighbour. The demographic survey, revealed that majority of those interviewed, 44% were in the age bracket 30-39 years. An equally high number was those from the age bracket 21-29 who made up (35%) of the respondents.

Figure 4 Respondents by sex

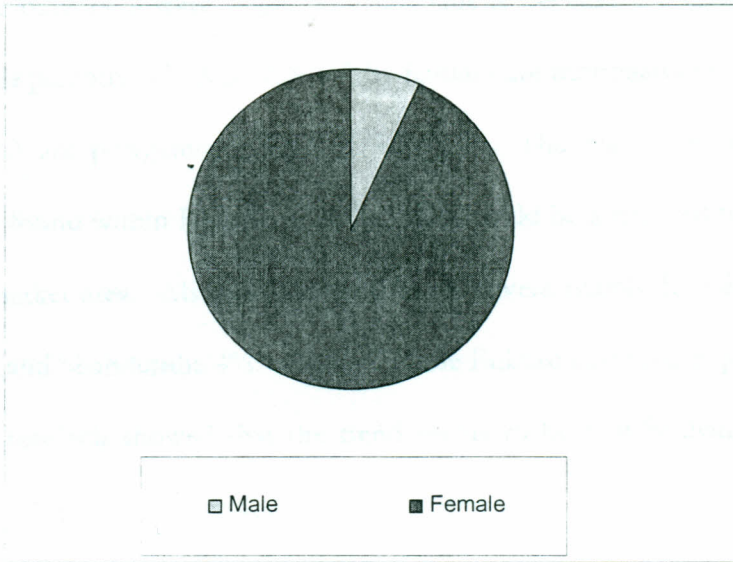
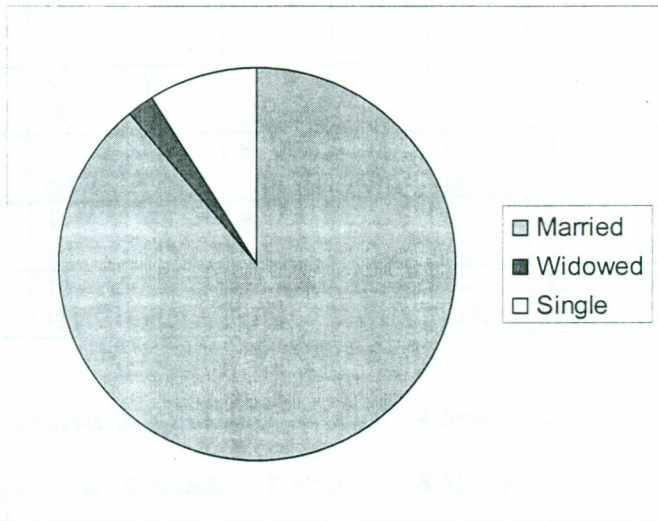


Figure 5: Marital Status of Respondents.



From the responses attained, an overwhelming majority of the respondents (89%) were married while only 11% were single (Fig 5). This is because the community still does not condone single parenthood. Also 75% of the families are monogamous while a relatively small number (19%) are polygamous families (Table 2). The highest number of single parent families were found within Kamukuywa 3%. This could be attributed to the proximity of the village to a market area. Also, polygamous families were mainly found within Wamono 4%, Nakalira 4%, and Shandumba 4%. Though in the Bukusu community polygamy is a common practice, the research showed that the trend seems to be rapidly dying off. This could be attributed to

Table 2: Type of family of the respondents.

Type of Family	SUBLOCATION 1-MAGEMO				SUBLOCATION 2- SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Single Parent	3 (3)	1 (1)	1 (2)	- -	- -	1 (2)	- -	- -	6 (6)
Monogamous	9 (9)	7 (7)	8 (8)	10 (10)	8 (8)	9 (9)	12 (12)	12 (12)	75 (75)
Polygamous	1 (1)	4 (4)	4 (4)	2 (2)	4 (4)	2 (2)	1 (1)	1 (1)	19 (19)
TOTAL	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

changing lifestyles of the people due to hard economic times, the widespread of HIV Aids Virus and because of lack of large pieces of land on which the wives would rely on for livelihood. Single parenthood in this society is not rampant due to strong rooted traditional belief systems which expects all women in the society to raise children in a marriage.

The respondents were expected to state the level of education they had attained. This is because it has been established that the level of education of a mother can have a great influence on the nutritional level of the pre-school children. Not only does it empower, her economically, but it influences the way she takes care of a child. Thus the study established that 8% of the respondents had not received any education, 32% had completed primary while 9% had completed secondary and 32% had some primary education. Of those remaining 18% some had secondary and only 1% had post secondary education (Table 3).

Table 3: Educational level of the respondents.

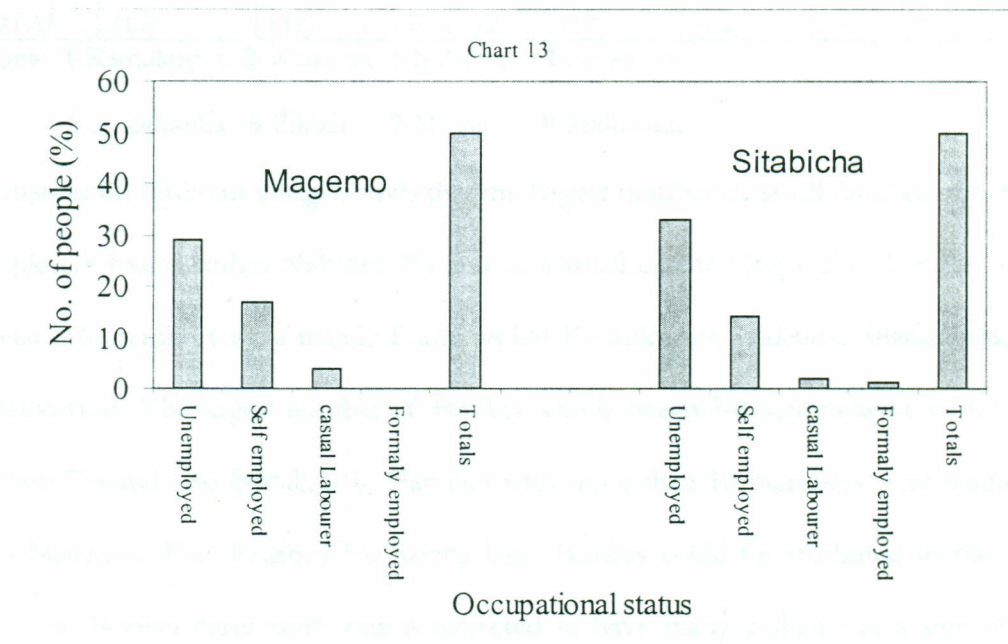
Educational Level	SUBLOCATION 1-MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	
None	-	1 (1)	-	1 (1)	2 (2)	2 (2)	-	2 (2)	8 (8)
Some primary	3 (3)	8 (8)	5 (5)	3 (3)	3 (3)	4 (4)	2 (2)	3 (3)	32 (32)
Completed primary	4 (4)	-	5 (5)	5 (5)	4 (4)	3 (3)	7 (7)	4 (4)	32 (32)
Some secondary	3 (3)	2 (2)	3 (3)	2 (2)	2 (2)	2 (2)	1 (1)	3 (3)	18 (18)
Completed secondary	2(2)	1(1)	-	1(1)	1(1)	1(1)	2(2)	1(1)	9(9)
Post Secondary	-	-	-	-	-	-	1 (1)	-	1 (1%)
TOTAL	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Information on different villages showed that, Shandumba, Bilibili, and Mukuyuni had the highest number of respondents who had not received any formal education, with each having 2%. Mfupi had the highest number of those who had finished primary level of education 7%. This could be attributed to the fact that the village is found in a region where farms are big, thus the people are better off economically. Additionally, the only person with post secondary education was found within Mfupi. Employment status of the respondents shows that, 62% of the respondents were not employed, while only 2%, were employed by either a person or an organization (Fig 6). Those who were self-employed made up 31% of the respondents, while those who did casual work made up 6% of the respondents. Those who were not employed came mainly from Bilibili 10% and Mukuyuni 9% villages, while the bulk of those who were self-employed came from Kamukuywa 6%. The later could be attributed to the fact that the village was found near a market place, thus people would involve

Figure 6: Occupational status of the respondents.



themselves in petty businesses. Additionally those not employed were doing petty businesses, which they did not consider to be employment.

The study also tried to determine the household structure. It was found that most households had between 4-6 members (34%) or 7-8 members (32%) (Table 4).

Table 4: Structure of the households.

Number of People	SUBLOCATION 1-MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	No %
2-3	1 (1)	- -	1 (1)	1 (1)	- -	- -	2 (2)	3 (3)	8 (8)
4-6	5 (5)	2 (2)	5 (5)	3 (3)	5 (5)	5 (5)	4 (4)	5 (5)	34 (34)
7-8	2 (2)	7 (7)	4 (4)	4 (4)	4 (4)	6 (6)	3 (3)	2 (2)	32 (32)
9-10	2 (2)	2 (2)	1 (1)	0 (0)	1 (1)	1 (1)	3 (3)	2 (2)	12 (12)
>10	3 (3)	1 (1)	2 (2)	4 (4)	2 (2)	- -	1 (1)	1 (1)	14 (14)
TOTAL	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Information on different village shows that the largest number of small families of between 2-3 people are found within Nakalira 3% and to a small extent Mfupi 2%. Families who had between 4-6 members were mainly found within Kamukuywa, Nakalira, Shandumba, Bilibili, and Mukuyuni. The largest number of families with between 7-8 members were found within Wamono 7% and also Bilibili, 6%. Families with more than 10 members were mainly found within Misemwa 4%. Reasons for having large families could be attributed to the fact that among the Bukusu community one is expected to have many children as a sign of wealth.

Also, family planning methods are usually not condoned by husbands who believe that if used, they make their wives promiscuous. Additionally, many children are essential so that if death of parents occurred, some would remain to carry on the family name and inherit the parent's property. Notwithstanding, most women have many children to act as a source of security for their marriages. This is especially common in polygamous families. In other circumstances existence of large families could have been attributed to dependants especially relatives who shared in the same dietary pot. Households with between 2-3 members 8% was attributed to the fact that in some cases, the couple was newly married and had very few children or the person was very old, hence all his/her children were grown up having only grand children. Also, small households were those of single mothers who only stayed with their children as dependants.

4.2: CHARACTERISTICS OF THE COMMUNITY

Characteristics of the community were determined in order to get a clear picture on the type of community in which the study was carried out. This was done by looking at the agricultural activities carried out in the study area in terms of the types of crops grown and animals kept within the community. Also there was need to find out about the state of the water in the community, sanitary conditions and lastly about the housing situation of the research group

4.2.1: Agriculture

Land Ownership

The study wanted to establish the number of people owning their land. From the study, it was established that a majority of the respondents (91%) owned their own land while only (9%) had no land (Fig. 7). The latter was made up of those single parents (mothers) who relied on parents for provision of everything and those

Figure 7: Do you own land

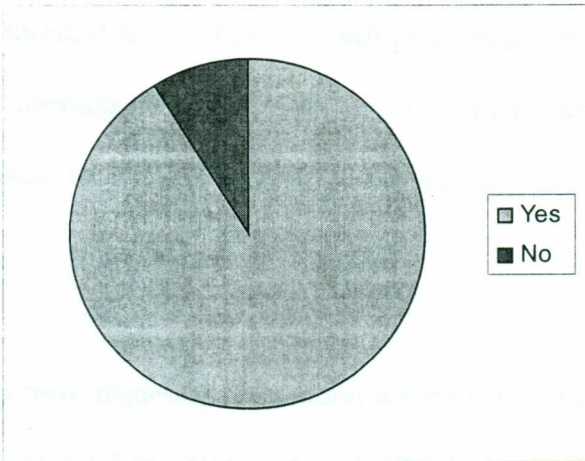
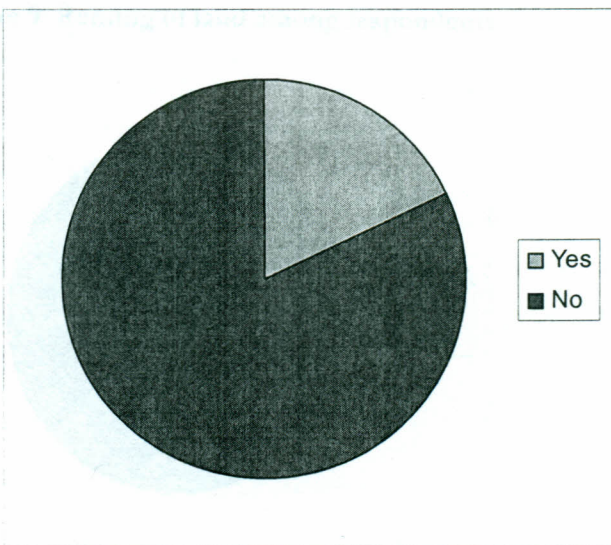


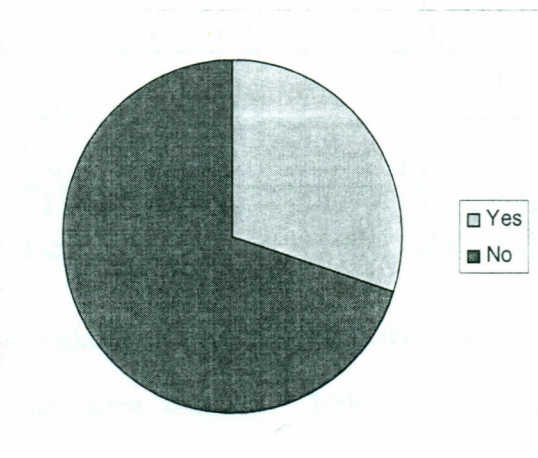
Figure 8: Do you lease land



staying on the market. Also in this group were those who were taking care of someone's farm hence had no land of their own. Majority of the landowners (82%) were not leasing out their land (Fig 8). This could be attributed to the fact that pieces of land had been highly subdivided leaving only small portions for each household. This is considering the fact that most of it was ancestral land. For the small percentage (18%) that leased out, it was done when there was pressing need for money or when there was no income to buy inputs like fertilizer and seeds to till and plant. This was attributed to the high price of these commodities.

The respondents were requested to mention whether they had rented land in the past year. Though majority (70%) had not rented land, 30% had rented land (Fig 9). It was done by those with small pieces of land and needed more land to grow food. Some of these people were living in ancestral lands which due to a lot of subdivision was not enough to grow food crops: In many circumstances rented land was used to grow cash crops like sunflower or sugarcane. To a smaller extend, rented land was used for the growth of maize, millet, cassava or vegetables.

Figure 9: Renting of land among respondents



Respondents were expected to state the amount of land they owned. It was established that the largest category of land holders were small landholders owning between 1-2 acres of land 41% or less than 1 acre 22% (Table 5). The smallest category of landholders (5%) had between 7-10 acres of land. Comparisons made between villages showed that Misemwa and Shandumba had the highest number of respondents making up (8%) and (7%) respectively owning between 1-2 acres of land. On the other hand those owning 3-4 acres of land were mainly found in Wamono village, 5%.

Table 5: Ownership of land in acres

No. of acres Owned	SUBLOCATION 1-MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	No %
<1	3 (3)	2 (2)	5 (5)	- (-)	2 (2)	2 (2)	5 (5)	3 (3)	22 (22)
1-2	4 (4)	4 (4)	4 (4)	8 (8)	7 (7)	3 (3)	5 (5)	6 (6)	41 (41)
3-4	1 (1)	5 (5)	- (-)	3 (3)	2 (2)	3 (3)	3 (3)	2 (2)	19 (19)
5-6	- (-)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	- (-)	1 (1)	6 (6)
7-10	1 (1)	- (-)	2 (2)	- (-)	- (-)	1 (1)	- (-)	1 (1)	5 (5)
Landless	4 (4)	- (-)	1 (1)	- (-)	- (-)	2 (2)	- (-)	- (-)	7 (7)
Total	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Animal Husbandry

The respondents were expected to state whether they owned animals or not. It was found out that 68% owned animals while 32% did not own any animals. Of these responses many of those who owned animals came from Mfupi 10% and Mukuyuni 10%. All the respondents from Misemwa owned some animals 12%, while the highest number of those who did not own animals came from Nakalira 8%. The respondents were also expected to list the type of animals that they owned. A total of 158 responses were elicited (Table 6). Nearly half the respondents (42.4%) owned birds. These included chicken, which were the majority then ducks, turkeys and pigeons. However a number of respondents complained that their flocks of chicken had died of plague. A higher number of respondents owned sheep (10.1%) compared to goats because in this community sheep is used for a lot of traditional ceremonies to keep of evil spirits especially during circumcision, funerals, or as sacrifices for the dead.

Table 6: Types of domestic animals owned by the respondents

Types of Animals	SUBLOCATION 1-MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Cattle	4 (2.5)	7 (4.4)	3 (1.9)	8 (5.1)	5 (3.2)	5 (3.2)	7 (4.4)	6 (3.8)	45 (28.5)
Sheep	-	1 (0.6)	-	6 (3.8)	-	3 (1.9)	5 (3.2)	1 (0.6)	16 (10.1)
Goats	-	-	-	1 (0.6)	-	-	-	1 (0.6)	2 (1.2)
Birds	7 (4.4)	9 (5.7)	5 (3.2)	10 (6.3)	7 (4.4)	6 (3.8)	11 (7)	12 (7.6)	67 (42.4)
None	6 (3.8)	3 (1.9)	8 (5.1)	-	5 (3.2)	4 (2.5)	2 (1.3)	1 (0.6)	29 (18.4)
Total	17 (10.7)	20 (12.6)	16 (10.2)	25 (15.8)	17 (10.8)	18 (11.4)	25 (15.9)	20 (13.2)	158 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Food Production

The study sought to establish the type of crops grown by the respondents. It was established that 18% of the respondents grow root tubers. These includes sweet potatoes, cassava, and arrowroots. A slightly smaller number grow cereals (16.5%), which include maize millet, and sorghum. Those who grow vegetables and fruits make up (16.5%) of the respondents (Table 7). The root tubers are popular because most of them need very few inputs in terms of fertilizer and insecticides. They also need very little care, while cassava is often mixed with sorghum and ground into flour. This is then used to prepare 'ugali' or porridge.

Table 7: Type of crops grown

Type of Crops Grown	SUB-LOCATION 1- MAGEMO				SUB-LOCATION 2 - SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	
Root Tubers	8 (1.7)	12 (2.6)	7 (1.5)	10 (2.2)	11 (2.4)	10 (2.2)	13 (2.8)	12 (2.6)	83 (18)
Cereals	9 (1.9)	9 (1.9)	10 (2.2)	9 (1.9)	9 (1.9)	9 (1.9)	11 (2.4)	10 (2.2)	76 (16.5)
Pulses	6 (1.3)	6 (1.3)	10 (2.2)	8 (1.7)	5 (1.2)	8 (1.7)	11 (2.4)	9 (1.9)	63 (13.6)
Vegetables	8 (1.7)	9 (1.9)	11 (2.4)	9 (1.9)	9 (1.9)	8 (1.7)	12 (2.6)	10 (2.2)	76 (16.5)
Fruits	8 (1.7)	11 (2.4)	11 (2.4)	10 (2.2)	9 (1.9)	8 (1.7)	11 (2.4)	8 (1.7)	76 (16.5)
Oil related crops	6 (1.3)	5 (1.2)	4 (0.9)	4 (0.9)	3 (0.6)	3 (0.6)	3 (0.6)	5 (1.2)	33 (7.1)
Sugarcane	7 (1.5)	5 (1.2)	4 (0.9)	3 (0.6)	4 (0.9)	7 (1.5)	7 (1.5)	6 (1.3)	43 (9.3)
Sunflower	2 (0.4)	1 (0.2)	2 (0.4)	- -	1 (0.2)	- -	3 (0.6)	3 (0.6)	12 (2.6)
Total	54 (11.5)	58 (12.7)	59 (12.9)	53 (11.4)	51 (11)	53 (11.3)	71 (15.3)	63 (13.7)	462 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

4.2.2: State of water in the community

There was need to find out information about the sources of water for the community under study. This is because studies have shown that the type of water consumed by a community can affect the nutritional status of pre-school children. Results show that over half of the study population (60.8%) get their water for use and drinking from rivers or streams (Table 8).

Table 8: Respondent's sources of water

Sources of water	SUBLOCATION 1-MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
River /Stream	11 (7.3)	11 (7.3)	12 (7.9)	12 (7.9)	12 (7.9)	10 (6.6)	13 (8.6)	11 (7.3)	92 (60.8)
Tap	-	-	-	-	-	-	-	2 (1.3)	2 (1.3)
Borehole	7 (4.6)	8 (5.3)	5 (3.3)	7 (4.6)	7 (4.6)	5 (3.3)	6 (4)	5 (3.3)	50 (33)
Well	-	-	2 (1.3)	-	-	-	1 (0.7)	-	3 (2)
Rain Water	1 (0.7)	-	-	1 (0.7)	1 (0.7)	-	1 (0.7)	-	4 (2.8)
Total	19 (12.6)	19 (12.6)	19 (12.6)	20 (13.2)	20 (13.2)	15 (9.9)	21 (14)	18 (11.9)	151 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

This water is mainly used for drinking as the respondents believe it is free of pathogens since it is moving constantly. On the other hand only (1.3%) of the study population have the access of tap water. Apart from those who have tap water, 51% of the other respondents get water

from sources which are unprotected, leading to likely association between the type of water consumed and the occurrence of water born diseases. Only (49%) of the water sources are protected. The highest number of respondents who get water from unprotected sources come from Mfupi 8%, Misemwa 7.3% and Nakalira 7.3%. In most of these sources it is the same places where people bath, where animals drink and where they wash their clothes. Thus, when there are heavy rains some mothers reported that some of their members got rashes after drinking water from these sources and their children suffered from frequent bouts of diarrhea. Also, most respondents conceded that they did not boil water for drinking. This could be the cause of high incidences of diarrhea that occurred after the rainy season. Another category of the respondents (33%), fetch water from bore holes, which are not protected. Water drawn from these sources is used for cooking and for washing. Rain water, was not mainly used by the respondents because most of them have grass thatched houses. Only (2.8%) of the respondents use rainy water especially for drinking.

4.2.3: Sanitary conditions

Sanitary conditions of a community can greatly play a role in the control or the spread of most waterborne diseases. Among young children, poor sanitary conditions play a major role in the spread of diseases such as diarrhea and dysentery, which often have a negative effect on the nutritional status of pre-school children. The study therefore aimed at finding out places where rubbish was disposed off by the respondents. From the results, only (35%) of the respondents had compost pits or waste bins while (56%) threw their rubbish in the farm (Table 9). A small number 9% were observed to have rubbish all over the home compound. This greatly attracted houseflies especially in the kitchen which could play a big role in the spread of diseases.

Table 9: Where the respondents throw their rubbish

Where the rubbish is disposed	SUBLOCATION 1 -MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Composite/ Waste Bin	6 (6)	4 (4)	5 (5)	6 (6)	3 (3)	3 (3)	4 (4)	4 (4)	35 (35)
Throw anywhere	- -	2 (2)	2 (2)	- -	1 (1)	2 (2)	2 (2)	- -	9 (9)
Throw in the farm	7 (7)	6 (6)	6 (6)	6 (6)	8 (8)	4 (4)	7 (7)	9 (9)	56 (56)
Total	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Further observations were carried out in the homestead to determine whether homes had pit latrines or not. From the study, it was observed that 72% of the homes had pit latrines while more than a quarter (28%) did not have pit latrines. In this regard, they were forced to go to the bushes. This is a big number which would lead to the spread of water-borne diseases, especially if human waste found its way into drinking water sources. The highest number of homes which did not have pit latrines were from Nakalira 5% and Wamono 5% villages. Among those who had toilets most of them were just temporary structures whereby, a hole is dug and maize stalks are put around it to provide some privacy. In all circumstances the roof is often left open, and the structure is left without a door. The floor was often left intact with grass which later on was worn out leaving it muddy. The same place was also used as a bathroom.

Also, it was necessary to find out whether homes had a drying rack for utensils. It was established that 43% had drying rack for utensils while 57% did not have. Those who did not have were observed to be putting their washed utensils on the ground, which was lined with either polythene papers or a mat.

4.14: Housing conditions

An appraisal of the quality of the houses under study was carried out, to give a picture on the socio-economic status of the community under study. In this regard, observations were carried out to determine the type of materials that had been used in building houses. It was found that only 11% of the walls were made of brick while the rest 89% were made of mud. Appraisal of the roof showed that 48% of the houses were made of iron sheets, 52% were grass thatched, while only 10% of the houses had cemented floors and the rest 90% had mud floors.

There was also need to find out if households had set aside a separate section/house to act as a kitchen. The results showed that most homes (72%) had a separate section or house for use as a kitchen while only 28% did not have. Further appraisal of the houses showed that 59% of the households had 2 rooms in the main house, while only 5% had five rooms or more.

4.3: SOURCES OF INCOME

4.3.1: Sources of income of household heads

The respondents were expected to list several activities which household heads carried out to act as sources of income. However, after data collection they were divided into farm and non-farm sector sources of income and then placed into seven major categories. (Table 10)

Table 10: Sources of income of household heads.

Sources of Income	SUBLOCATION 1- MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	
Non farm sector									
Transport industry	- (-)	- (-)	- (-)	1 (1.3)	1 (0.7)	1 (0.7)	2 (1.4)	- (-)	5 (3.5)
Casual labourers	2 (1.4)	3 (2.1)	5 (3.4)	- (-)	1 (0.7)	1 (0.7)	2 (1.4)	1 (0.7)	15 (10.4)
Salaried employment	2 (1.4)	2 (1.4)	6 (4.1)	5 (3.4)	2 (1.4)	9 (6.2)	5 (3.4)	2 (1.4)	33 (22.8)
Cereal business	4 (2.8)	2 (1.4)	2 (1.4)	2 (1.4)	1 (0.7)	- (-)	3 (2.1)	3 (2.1)	17 (11.7)
Petty business	4 (2.8)	3 (2.1)	8 (5.5)	5 (3.4)	3 (2.1)	4 (2.8)	4 (2.8)	8 (5.5)	39 (27)
Farm sector									
Farming	2 (1.4)	5 (3.4)	3 (2.1)	3 (2.1)	6 (4.1)	- (-)	3 (2.1)	4 (2.8)	26 (17.9)
Others	- (-)	2 (1.4)	3 (2.1)	1 (0.7)	- (-)	- (-)	3 (2.1)	1 (0.7)	10 (6.9)
Total	14 (9.8)	17 (11.8)	27 (18.6)	17 (11.3)	14 (9.7)	15 (10.4)	22 (15.3)	19 (13.2)	145 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

From the responses 3.5% indicated that household heads earned their income from the transportation industry. These included transportation of people from one area to another using bicycles (bicycle taxis) by paying a fee. The fee ranged from Ksh. 10/= to Ksh. 40/= per trip depending on the distance. In this category included those who used carts to ferry people and goods such as maize, sunflower or bricks from one place to another at a fee. Other responses showed that household heads earned their income by doing casual labour.

This formed 10.34% of the responses. Such work included assisting those carrying out construction work, digging bore holes or pit latrines, and aiding in harvesting of maize in large scale farms at a fee.

Another (22.8%) respondents indicated that household heads earned a living by getting a steady salaried income. Among the jobs they did included teaching, being a driver, acting as guards in security firms. Others included masons and carpenters. However, their salaries kept fluctuating depending on whether there was a contract and the length of the contract at stake. For those with steady jobs salaries ranged between Ksh. 500- 8,000 per month. In this category were household heads who did jobs like tea picking, mechanics, and drivers of individuals or companies.

Another category of respondents (11.7 %) indicated that household heads earned their income by carrying out cereal business. This involved buying and selling of cereals such as maize, millet, sorghum and also beans. Slightly more than a quarter of the respondents, 27%, who indicated that household heads involved themselves in petty businesses. These included buying and selling of cattle, selling sugarcane on a small scale, making and selling of ropes, baskets, traditional granaries and then in taking photographs. Others were involved in the selling of fruits such as bananas, passion fruits, pineapples, avocados and oranges. In this category there was only one respondent who was involved in the processing of cooking oil from sunflower for sale locally.

Only (18%) of the household heads are involved in the earning of income from farming. These could be attributed to the fact that most farms are small in size despite the large families, hence whatever was grown was being used for the provision of food. However, those who

relied on farming as a source of income grew crops like maize, sunflower and sugarcane on a large scale, which were later harvested and sold.

The rest of the respondents 6.9% relied on activities such as keeping home kiosks (canteen) and selling of medical drugs at retail prices in homes. These also included those who involved themselves in illegal trade such as the sale of illicit brews like 'chang'ad' and "busad". Most of the respondents used traditional cereals like millet and soghum to make illicit brew.

Information from different villages shows that, most of those who were involved in the transport industry came from Mfupi village 1.4%. This could be attributed to the fact that the village is very close to a junction road leading from the main road, from which most of the feeder roads are impassable. Nakalira village has the most number of household heads who act as casual laborers 3.4%, while Bilibili has the highest number of household heads who have salaried employment 6.2%. Those who deal in petty businesses mainly come from Nakalira 5.5% and Mukuyuni 5.5%. This could be attributed to the fact that the two villages are found in a rocky area making their land unproductive. Thus, they had to resort to business in order to earn a living. Household heads who earned a living from the farm sector mainly came from Shandumba 4.1%. This could be attributed to the fact that the in this region soils are generally good.

4.3.2: Sources of income of the spouses

The respondents were requested to mention three main sources of income of the spouse in each household. A spouse was meant to refer to the wife of a household head. A total of 207 sources of income were mentioned (Table 11) whereby 32% of respondents mentioned selling of bananas as the main source of income of spouses.

Table 11: Sources of income of spouses.

Sources of Income	SUBLOCATION 1-MAGEMO					SUBLOCATION 2 SITABICHA			TOTAL
	Villages					Villages			
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Non-farm Sector									
Selling bananas	7 (3.4)	9 (4.3)	12 (5.8)	7 (3.4)	8 (3.9)	8 (3.9)	7 (3.4)	8 (3.9)	66 (32)
Casual labourers	-	1 (0.5)	3 (1.4)	2 (1)	1 (0.5)	2 (1)	2 (1)	1 (0.5)	12 (5.9)
Cereals business	-	2 (1)	-	6 (2.9)	2 (1)	4 (1.9)	5 (2.4)	3 (1.4)	22 (10.6)
Selling vegetables	5 (2.4)	1 (0.5)	4 (1.9)	3 (1.4)	3 (1.4)	2 (1)	4 (1.9)	1 (0.5)	23 (11.)
Salaried Employment	-	-	-	-	1 (0.5)	-	1 (0.5)	-	2 (1)
Women group Activities	-	1 (0.5)	-	-	1 (0.5)	-	2 (1)	1 (0.5)	5 (2.5)
Petty business	2 (1)	7 (3.4)	7 (3.4)	4 (1.9)	2 (1)	4 (1.9)	9 (4.3)	3 (1.4)	38 (17.4)
Selling hand Made articles	-	-	1 (0.5)	2 (1)	-	-	2 (1)	1 (0.5)	6 (3)
Production Industry	2 (1)	1 (0.5)	3 (1.4)	-	-	3 (1.4)	-	1 (0.5)	10 (4.8)
Farm Sector									
Farming	1 (0.5)	1 (0.5)	1 (0.5)	1 (0.5)	2 (1)	2 (1)	1 (0.5)	1 (0.5)	10 (5)
Nothing	5 (2.4)	1 (0.5)	1 (0.5)	2 (1)	1 (0.5)	2 (1)	1 (0.5)	-	13 (6.4)
Total	22 (10.4)	24 (11.7)	32 (15.4)	27 (13.1)	21 (10.3)	27 (13.1)	34 (16.5)	20 (9.7)	207 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

This is because it is grown in almost every home and therefore it is sold at wholesale or retail prices at Kamukuywa or Kimili market. Others 5.9% were involved in casual labour, which involved harvesting crops for different individuals, tilling land and weeding crops at a fee for people with large farms or to be given food. Another category, 17.4% were involved in petty business which involved selling second hand clothes (mtumba), or running retail shops. Another 3% of the

respondents were involved in making and selling hand made articles such as baskets, pots, gourds and ropes.

Some respondents were involved in production industry. Only (4.8%) respondents were involved. These included the production of the illicit brews 'chang'aa' and 'busaa'. It also included the preparation of cooking oil from sunflower for sale locally. However, given right resources and incentives it would thrive. The least number of respondents 1% were involved in salaried employment which is very low compared to that of household heads. This is an indication that Spouses who were the women had much lower education, and thus could not easily get salaried employment. Also, 6.5% of the respondents said that the spouses were not doing anything. In this regard they relied wholly on the household heads who in most cases is the man, to provide for all the needs of the family.

Information on different villages showed that the village with the highest number of spouses involved in the selling of bananas came from Nakalira, 5.8% and Wamono, 4.3%. Spouses who were involved in petty business were found in Wamono 3.4%, Nakalira 3.4% and Mfupi 4.3%.

4.4: PRE-SCHOOL CHILD FEEDING PATTERNS

4.4.1: Weaning practices and types of food given

There are strong indications to show that children only grow and develop rapidly as a result of the type of food they eat. This is especially crucial during the introduction of other foods besides breast milk at the recommended age of between 4-6 months.

From the study it was established that children were mainly introduced to other foods besides breast milk at the age 2-4 months 40% (Table 12).

Table 12: Period when supplementary food was first given.

When Supplementary Food was First Given	SUB-LOCATION 1 -MAGEMO					SUB-LOCATION 2- SITABICHA			TOTAL
	Villages					Villages			
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
A few days after birth	2 (2)	- -	1 (1)	- -	- -	1 (1)	- -	- -	4 (4)
Less than or equal to a month	1 (1)	2 (2)	1 (1)	1 (1)	1 (1)		2 (2)	2 (2)	10 (10)
2 – 4 Months	4 (4)	4 (4)	9 (9)	4 (4)	4 (4)	4 (4)	5 (5)	6 (6)	40 (40)
5 – 11 Months	2 (2)	- -	- -	1 (1)	2 (2)	1 (1)	1 (1)	2 (2)	9 (9)
12 – 24 Months	- -	- -	1 (1)	- -	1 (1)	2 (2)	- -	- -	4 (4)
2 – 3 years	- -	- -	- -	- -	- -	- -	1 (1)	- -	1 (1)
Complete Weaning	4 (4)	6 (6)	1 (1)	6 (6)	4 (4)	4 (4)	4 (4)	3 (3)	32 (32)
TOTAL	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

A big number of these were from Nakalira village (9%). However some were introduced when they were as young as a few days old, while 10% were introduced when they were less than a month. Only (1%) of the children were introduced to supplementary foods while they were between 2-3 years. Mothers who gave supplementary food to their children when they were less than 2 months complained that later on the children did not want porridge. This

could be attributed to the fact that either the weaning foods were introduced to the child too early, or the food was poorly prepared. The remaining 32% of the children had undergone a complete weaning process and were thus eating adult diet.

Further results attained on the types of weaning foods frequently given to pre-school children showed that 41% are fed on carbohydrate foods of which the most common are cooked bananas, “ugali”, sweet potatoes, and cassava porridge (Table 13). The highest number of children who were fed on carbohydrate foods came from Nakalira village 11.3%. This could be attributed to the fact that the village is generally found in a rocky area, rendering it hard to grow other crops apart from those that can do well in poor soils, such as cassava. The second type of food mostly fed to children are from the protein group 13.2% which include milk, meat, fish and beans. This low percentage could be attributed to the fact that these foods are very expensive to buy, very few people rear cattle and so milk is not easily available. If these products are available at home they are often sold to meet other needs since they fetch high prices on the local market.

Sources of proteins such as chicken and eggs, where available were often sold at the local market to meet other costs such as grinding maize meal flour, taking a child to hospital or even used to buy maize during times of food scarcity. At the time of research most respondents were lamenting for the loss of their chicken to a disease that had swept whole flocks.

Table 13: Types of weaning foods given to pre-school children.

TYPES OF FOODS	SUBLOCATION 1 -MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Proteins (Milk, meat, Fish, beans)	3 (2)	1 (0.7)	4 (2.6)	2 (1.3)	2 (1.3)	- (-)	5 (3.3)	3 (2)	20 (13.2)
Carbohydrates (sweet potatoes, Ugali, Porridge, Cooked bananas)	6 (4)	5 (3.3)	17 (11.3)	6 (4)	7 (4.6)	9 (6)	7 (4.6)	5 (3.3)	62 (41)
Vitamins (Fruits and Vegetables)	- (-)	1 (0.7)	5 (3.3)	1 (0.7)	1 (0.7)	1 (0.7)	1 (0.7)	- (-)	10 (6.8)
Beverage (Tea)	- (-)	1 (0.7)	3 (2)	1 (0.7)	2 (1.3)	- (-)	4 (2.6)	- (-)	11 (7.3)
Complete Weaning	6 (4)	8 (5.3)	4 (2.6)	6 (4)	- (-)	7 (4.6)	7 (4.6)	10 (6.6)	48 (31.7)
Total	15 (10)	16 (10.7)	33 (21.8)	16 (10)	12 (7.9)	17 (11.3)	24 (15.8)	18 (11.9)	151 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

In other households mothers withheld foods like meat from children claiming that the children did not like the way it tastes. In terms of villages, in Bilibili no respondent mentioned protein foods as part of weaning food given to pre-school children, while there was generally a low consumption of vitamin foods since only 6.8% of the respondents claimed that children ate food from the vitamin group during the weaning period. These included vegetables especially traditional ones like "Mrere" (*Corchorus trilocularis*), "Kimiro" (*Crotalaria ochroleuca*), "Litoto" (*Amaranthus hybridus*), "Namasaka" (*Solanum nigrum*), "Chisaka" (*Gynandropsis gynandra*), and Cowpies leaves. Fruits though widely grown like passion, pineapples, pawpaws, avocados and

locquards, were mainly sold to fetch money to buy carbohydrate foods or to meet other needs. Also, no respondent mentioned a vitamin group of food as being given to pre-school children within Kamukuywa and Mukuyuni. This could be attributed to either lack of mothers understanding on the importance of the vitamin foods to the body or lack of the availability of the food.

While carrying out the study there was need to establish modes of feeding by which mothers administered the prepared food to their children. This was aimed at determining mothers knowledge on the unsuitability of bottle feeding and effects on the normal growth of children. From the responses attained, it was established that 44.6% of the children were fed on a cup and spoon, 31.2% were fed by hand while 2.4% were fed using the bottle (Table 14).

This shows that mothers were aware of the bad effects of bottle feeding to their children. However, mothers who claimed to give their children fluids using cups were using very small plastic cups, which had small holes at the top and a sprout. Since they are made of plastic, they cannot be disinfected by boiling posing a great danger to the health of the young children. Also, the small holes could harbor some dirt making it hard to thoroughly clean it and with time causes infections like diarrhoea, and other water born diseases like dysentery. Of those fed by hand, it included actual observations of children feeding themselves by hand or cases where force-feeding was done by hand.

In the latter case, the child was laid between the thighs of a Care-taker facing up and a hand was placed just below the mouth. Afterwards, fluids like porridge were forcefully poured just below the mouth. All, the while the child's nose was held to prevent breathing and to make it swallow the food.

Table 14: Modes of feeding.

Modes of Feeding	SUBLOCATION 1 -MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Cup and Spoon	7 (5.6)	5 (4)	6 (4.8)	8 (6.3)	6 (4.8)	6 (4.8)	11 (8.7)	7 (5.6)	56 (44.6)
Bottle	1 (0.8)	- -	- -	1 (0.8)	- -	1 (0.8)	- -	- -	3 (2.4)
Hand	2 (1.6)	5 (4)	5 (4)	6 (4.8)	5 (4)	5 (4)	7 (5.6)	4 (3.2)	39 (31.2)
Complete weaning	5 (4)	4 (3.2)	4 (3.2)	2 (1.6)	3 (2.4)	4 (3.2)	1 (0.8)	5 (4)	28 (22.4)
Total	15 (12)	14 (11.2)	15 (12)	17 (13.5)	14 (11.2)	16 (12.8)	19 (15.1)	16 (12.8)	126 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

This method of feeding was used by mothers whose children were poor at eating hence the need to force them. However, the method is very out-dated and unhygienic especially if the mother does not wash her hands. Thus, it was not uncommon to see mothers who had just come from the shamba and without washing their hands proceeded to give their children food by hand. Others 22.4% were grown up children who could eat using a spoon or could drink liquids from a cup thus needing no assistance.

The study also found out that though children were expected to eat alone, 66% ate their meals with adults, while 27% were fed after adults had eaten (Table 15). This would in turn affect the amount of food eaten by children since they generally eat slowly. Also when they eat after

adults have eaten, it means they may not get the best food, especially proteins. For instance during the study it was not uncommon to see children eating "ugali" with only soup while the head of the family who in this case is the father was given a lot of meat or protein foods such as eggs.

Table 15: Showing the order in which children eat

Order in which children eat	SUBLOCATION 1-MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Eat alone	1 (1)	- -	- -	2 (2)	1 (1)	- -	2 (2)	- -	6 (6)
Eat With Adults	8 (8)	8 (8)	9 (9)	10 (10)	6 (6)	8 (8)	7 (7)	10 (10)	66 (66)
Eat after adults have eaten	4 (4)	4 (4)	4 (4)	- -	4 (4)	4 (4)	4 (4)	3 (3)	27 (27)
Eat before adults have eaten	- -	- -	- -	- -	1 (1)	- -	- -	- -	1 (1)
Total	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

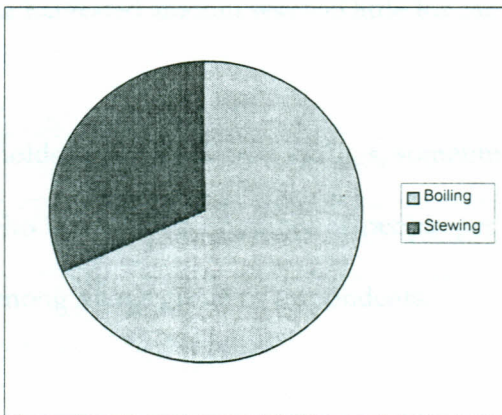
With time this would affect the state of health of the children. This practice is very common among the Bukusu community, because the household head and/ or visitors ate first then the children and women ate last. Only (6%) of the children ate alone while 1% ate before adults had eaten. In terms of villages only four recorded cases of children eating

alone. However, of those who ate with adults it was established that the highest number was from Misemwa 10% and Mukuyuni 10%. The only case where children ate before adults had eaten came from Shandumba.

4.4.2: *Methods of food preparation for pre-school children*

The respondents were expected to state the different methods used in preparing weaning food for pre-school children. The responses attained showed that the common cooking methods used include boiling 68% and to a lesser extent stewing 32% (Fig 10). Food prepared by boiling included mainly porridge. Other foods such as bananas and sweet potatoes were often boiled then mashed before being given to the children. Stewing as a method of food preparation was used when cooking indigenous vegetables, fish or meat.

Figure 10: Methods of food preparation



Since it was established that all mothers use porridge as a weaning food there was need to determine whether mothers added anything to it after cooking, before administering to the pre-school children. This is because there is a strong consensus to the effect that porridge should be made energy dense before being given to children. This enables them to especially double their weight within the first year of life making them to develop into healthy individuals. Responses showed that, more than a quarter of the mothers (27%) added milk and sugar to the porridge before giving to children, while 24.3% added nothing. A slightly small number (10.8%) of the mothers only added milk, 18.9% only added sugar while a very small number (5.4%) added fruit juice to prepared porridge. Another group of mothers, 13.5% added things like eggs, or used flour to which was added Sorghum, millet, groundnuts, 'Omenda' and Green grams.

4.4.3: Reasons for buying food

The respondents were expected to state reasons for buying or not buying food in the course of the year. This was done to show the main causes of food scarcity by the respondents. From the results obtained it is evident that 43.9% of the respondents bought food in the course of the year because the harvested amount was too little for the size of the households (Table 16).

Apart from households having their own siblings, sometimes they were staying with extended family members who increased the number of people per household. Thus harvested food had to be shared among a large group of respondents.

Table 16: Reasons for buying food

Reasons	SUBLOCATION 1-MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Harvested amount too little	5 (4.8)	6 (5.7)	7 (6.7)	8 (7.6)	5 (4.8)	1 (1)	6 (5.7)	8 (7.6)	46 (43.9)
Inputs too Expensive	1 (1)	2 (1.9)	-	-	-	1 (1)	1 (1)	2 (1.9)	7 (6.8)
Land too Small	3 (2.9)	1 (1)	1 (1)	2 (1.9)	2 (1.9)	8 (7.6)	1 (1)	1 (1)	19 (18.1)
Harvests Sold	2 (1.9)	-	4 (3.8)	1 (1)	4 (3.8)	-	2 (1.9)	-	13 (12.4)
Have no Land	-	5 (4.8)	-	-	-	2 (1.9)	-	-	7 (6.7)
Do not buy Food	1 (1)	2 (1.9)	1 (1)	2 (1.9)	-	2 (1.9)	3 (2.9)	2 (1.9)	13 (12.4)
Total	12 (11.6)	16 (15.3)	13 (12.5)	13 (12.4)	11 (10.5)	14 (13.4)	13 (12.5)	13 (12.4)	105 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Another category (18.3%) attributed their buying of food to the land being too small. Among these are those who said the land is too rocky. This especially occurred to households coming from near Nakalira village where most land has stones and boulders. Also, in this category were those who were totally landless such as single mothers. They therefore attained their food year round by buying. This is because among the Bukusu women and girls do not have the right of ownership of land. However some 12.5% did not buy food at all in the year round mainly because the families were still small, while others simply planted enough to go the year round.

4.5: CULTURAL PRACTICES AND BELIEFS RELATED TO FOOD

This section aimed at finding out the cultural practices and beliefs related to food, which pre-school children were subjected to within Ndivisi. In this regard there was need to find out whether there were foods that pre-school children were not supposed to eat. It was found that, 69% of the children were subjected to cultural practices and beliefs related to food while only (31%) did not follow such practices. Reasons for not following the practices were attributed to Christian religious beliefs, lack of any cultural beliefs related to food while some had left their ancestral homes to buy land in the study areas, thus losing touch with some cultural beliefs.

Further results on cultural practices of food, show that there are very many foods which respondents said pre-school children are not supposed to eat (Table 17). Majority of the respondents (51.9%) showed that any cow with stripes (*eng'enda*) is not supposed to be eaten and neither is its milk supposed to be consumed. Most respondents conceded that if any of these were consumed then it would make the body develop rashes. Additionally, another group of respondents said that if the meat of the cow was eaten or its milk drunk, it was bad because the cow is specifically used for certain traditional ceremonies such as being killed to "apeace" spirits of the dead. Information from different villages shows that Wamono 10.2% and Mfupi 10.2% had the highest number of respondents who were not supposed to eat meat from '*eng'enda*' cow.

Another category was made up of wild animals and birds such as "*Esefu*" 6.1%, "*Esunu*", 14.1% and '*Emande*' 1%. The wildebeest among some section was also not to be eaten. All these if consumed by the responsible clans would make the body to develop rashes.

Table 17: Types of food children are not supposed to eat

Type of food	SUBLOCATION 1 -MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
“Esefu”	-	-	-	1 (1)	3 (3.1)	-	2 (2)	-	6 (6.1)
“Eng’enda”+ Its Milk+ Its Meat	7 (7.1)	10 (10.2)	5 (5.1)	7 (7.1)	6 (6.1)	2 (2)	10 (10.2)	4 (4.1)	51 (51.9)
Green grams	-	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	-	6 (6)
“Esunu”	5 (5.1)	2 (2)	2 (2)	1 (1)	1 (1)	2 (2)	-	1 (1)	14 (14.1)
Food From traditional ceremonies (“Sitekho”)	-	1 (1)	-	-	-	1 (1)	-	1 (1)	3 (3)
“Mreremashamba” <i>corchorus trilocularis</i>	1 (1)	-	-	1 (1)	-	-	1 (1)	1 (1)	4 (4)
“Chifutu” <i>Vitex doniana</i>	-	-	-	-	-	-	1 (1)	-	1 (2)
Chicken	-	-	-	1 (1)	-	-	1 (1)	-	2 (2)
“Emande”	-	-	-	-	-	-	1 (1)	-	1 (1)
Guinea fowls	-	-	1 (1)	1 (1)	-	-	1 (1)	-	3 (3)
Meat of sheep’s head	-	1 (1)	1 (1)	1 (1)	-	-	1 (1)	-	4 (4)
Pigeon Ducks	-	1 (1)	-	-	-	-	-	-	1 (1)
Wildebeest Meat	-	-	1 (1)	1 (1)	-	-	-	-	2 (2)
Total	13 (13.2)	16 (16.2)	11 (11.1)	15 (15.1)	11 (11.2)	6 (6)	19 (19.2)	7 (7.1)	98 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Some members of clans like “Bakokho” are not supposed to eat chicken and eggs since it is seen to be sacred. However, if one is to eat chicken, then she/he has to take some traditional herbs, otherwise the whole body would develop rashes

Respondents were also requested to name the person most responsible in determining the type of food pre-school children were given or forbidden from eating. It was established that mothers 37% had the greatest influence on the type of food given to the child (Table 18).

Table 18: Person influencing the type of food given to pre-school children

Person influencing the type of food given to pre-school children	SUBLOCATION 1-MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Grand mother	4 (4)	4 (4)	6 (6)	3 (3)	4 (4)	4 (4)	3 (3)	7 (7)	35 (35)
Father	-	-	-	-	-	1 (1)	-	-	1 (1)
Child's Clan	-	-	1 (1)	1 (1)	-	-	1 (1)	-	3 (3)
Mother	3 (3)	-	5 (5)	3 (3)	7 (7)	5 (5)	9 (9)	5 (5)	37 (37)
Other	6 (6)	8 (8)	1 (1)	5 (5)	1 (1)	2 (2)	-	1 (1)	24 (24)
Total	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Another great influence comes from the paternal grandmothers of the pre-school children 35%. This could be attributed to the fact that some mothers were either young and needed guidance on choices of food and how to prepare them for the child, while others were staying

together with their mother in-laws who assisted in taking care of their grandchildren when the mother was away

4.6: CHILD CARE PRACTICES

Knowledge on child-care practices is very essential, since it determines the adequacy with which children can be breast-fed, how well their food is prepared and how they are attended to. It is with this in mind that there was need to find out under whose care the children had been left. It was established that 84% of the children were left under the care of their mothers (Table 19).

This could be attributed to the fact that interviews were only conducted in households where someone could give the most accurate information about the pre-school children which to a large extent is the mother and to a small extent the father. In very few homes (7%) the grandmothers were left with the care of the children, while only (2%) of the respondents were the sister, taking care of the child under study. In some homes where mothers could not be found, children were left under the care of their young siblings who were sometimes as young as five years. Hence children could stay the whole day without a meal until when the mother came back. Alternatively, the mother would leave cooked food such as boiled sweet potatoes or porridge, for the children to eat for lunch until when she finally came back.

This may have a great influence on the health of the children since it is consumed cold, in most cases it is left without being covered the whole day leading to the exposure to flies, and this can contribute to the occurrence of diarrhoeal diseases.

Table 19: Person caring for the Child

Person Caring for the Child	SUBLOCATION 1 -MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Mother	10 (10)	11 (11)	11 (11)	12 (12)	9 (9)	11 (11)	11 (11)	9 (9)	84 (84)
Father	2 (2)	- -	2 (2)	- -	1 (1)	- -	1 (1)	- -	6 (6)
Sister	1 (1)	- -	- -	- -	- -	- -	- -	1 (1)	2 (2)
Grandmother	- -	1 (1)	- -	- -	2 (2)	- -	1 (1)	3 (3)	7 (7)
Other	- -	- -	- -	- -	- -	1 (1)	- -	- -	1 (1)
Total	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

4.7: PRE-SCHOOL CHILDREN HEALTH AND NUTRITIONAL STATUS

There was need to find out the nutritional status of pre-school children in the course of the study. As a result, 100 households within Ndivisi location were visited, after which a total of 119 children from eight villages were diagnosed to determine the extent of malnutrition in the study area. Nutritional status of pre-school children was established by determining the anthropometric measurements in terms of Weight for Age (W/A), Height for Age (H/A), and Height for Weight (H/W). A child falling within $-3SD$ of the reference data was considered to be suffering from severe malnutrition, and $-1SD$ from mild malnutrition. However, a child falling within N was considered to be normal and not suffering from malnutrition. Also,

nutritional status of girls in relation to boys was also done. Comparisons were made of the nutritional status of children between sub-locations and between villages.

4.7.1: Weight for Age.

Within the study area it was established that there was existence of severe wasting, whereby 38.7% of the children examined fell within the -3SD index of the reference data for Weight for Age (W/A) (Table 20). This concurs with GOK, 1997 Development plan where 33% of the children were suffering from wasting

Table 20: Anthropometric measurements of pre-school children using NCHS reference standards W/A

Village	Girls				Boys				Total			
	N	-1SD	-2SD	-3SD	N	-1SD	-2SD	-3SD	N	-1SD	-2SD	-3SD
	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %
1	-	1 (0.8)	1 (0.8)	4 (3.4)	1 (0.8)	-	1 (0.8)	7 (5.9)	1 (0.8)	1 (0.8)	2 (1.7)	10 (8.4)
2	2 (1.7)	1 (0.8)	3 (2.5)	-	3 (2.5)	3 (2.5)	1 (0.8)	1 (0.8)	5 (4.2)	4 (3.4)	4 (3.4)	1 (0.8)
3	1 (0.8)	1 (0.8)	1 (0.8)	2 (1.7)	1 (0.8)	2 (1.7)	0	5 (4.2)	2 (1.7)	3 (2.5)	1 (0.8)	7 (5.9)
4	3 (2.5)	1 (0.8)	1 (0.8)	3 (2.5)	-	1 (0.8)	3 (2.5)	2 (1.7)	3 (2.5)	2 (1.7)	4 (3.4)	5 (4.2)
5	-	3 (2.5)	2 (1.7)	3 (2.5)	-	1 (0.8)	4 (3.4)	3 (2.5)	-	4 (3.4)	6 (5)	6 (5)
6	2 (1.7)	5 (4.2)	3 (2.5)	3 (2.5)	1 (0.8)	-	-	4 (3.4)	3 (2.5)	5 (4.2)	3 (2.5)	7 (5.9)
7	1 (0.8)	4 (3.4)	1 (0.8)	3 (2.5)	3 (2.5)	1 (0.8)	2 (1.7)	3 (2.5)	4 (3.4)	5 (4.2)	3 (2.5)	6 (5)
8	-	4 (3.4)	3 (2.5)	-	-	-	1 (0.8)	3 (2.5)	-	4 (3.4)	4 (3.4)	3 (2.5)
Total	9 (7.6)	20 (16.8)	15 (12.6)	18 (15)	9 (7.6)	8 (6.7)	12 (10)	28 (23.5)	18 (15)	28 (23.5)	27 (22.7)	46 (38.7)

Villages: 1-Nakalira 2-Shandumba 3-Bilibili 4-Wamono

5-Mfupi 6-Mukuyuni 7-Kamukuywa 8-Misemwa

Only a small percentage (15%) fell within the normal range of the reference data. Comparisons made between villages established that Nakalira had the highest total number of children suffering from severe wasting 9.2%, while Misemwa village had the least number suffering from severe wasting 2.5%. Shandumba had the highest number of children falling within the normal range 4.2% of the reference population, while Shandumba and Mfupi did not have any child falling within the normal range of the reference population in terms of W/A.

Comparisons were also made to determine the nutritional status of girls in relation to boys within the eight villages. Results show that in total more boys (23.5%) were wasted compared to girls (15.1%). However both sexes had 9% of its population falling within the normal range of the reference data in terms of W/A. Further comparisons within the villages shows that in total Nakalira had the highest number of boys 5.9% falling within the $-3SD$ of the reference data in terms of W/A, while Wamono, Mfupi and Misemwa did not have any boys falling within the normal range of the reference data. Also Shandumba and Misemwa did not have any girls falling within the $-3SD$ of the reference data in terms of W/A. Likewise, Kamukuywa, Shandumba, and Mukuyuni did not have any girls falling within the normal range of the reference population in terms of W/A.

4.7.2: Height for Age

Height for Age index was determined so as to measure the rate of stunting among pre-school children within Ndivisi location. The results show that there is severe stunting in the area which stands at 52.9%. This relates closely with GOK(1997) development plan where 41% of children under five years were shown to suffer stunting in Bungoma district. Only 10.1% of the children were categorized as falling within the normal range of the reference data (Table 21).

Table 21: Anthropometric measurements of pre-school children using NCHS reference standards H/A

Village	Girls				Boys				Total			
	N	-1SD	-2SD	-3SD	N	-1SD	-2SD	-3SD	N	-1SD	-2SD	-3SD
	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %
1	-	-	1	5	-	-	-	9	-	-	1	14
	-	-	(0.8)	(4.2)	-	-	-	(7.6)	-	-	(0.8)	(11.8)
2	1	1	4	-	1	3	1	3	2	4	5	3
	(0.8)	(0.8)	(3.4)	-	(0.8)	(2.5)	(0.8)	(2.5)	(1.7)	(3.4)	(4.2)	(2.5)
3	3	2	-	-	-	1	4	3	3	3	4	3
	(2.5)	(1.7)	-	-	-	(0.8)	(3.4)	(2.5)	(2.5)	(2.5)	(3.4)	(2.5)
4	-	2	2	4	1	-	2	3	1	2	4	7
	-	(1.7)	(1.7)	(3.4)	(0.8)	-	(1.7)	(2.5)	(0.8)	(1.7)	(3.4)	(5.9)
5	-	2	2	4	2	-	3	3	2	2	5	7
	-	(1.7)	(1.7)	(3.4)	(1.7)	-	(2.5)	(2.5)	(1.7)	(1.7)	(4.2)	(5.9)
6	-	3	3	7	1	-	-	4	1	3	3	11
	-	(2.5)	(2.5)	(5.9)	(0.8)	-	-	(3.4)	(0.8)	(2.5)	(2.5)	(9.2)
7	2	2	-	5	1	-	-	8	3	2	-	13
	(1.7)	(1.7)	-	(4.2)	(0.8)	-	-	(6.7)	(2.5)	(1.7)	-	(10.9)
8	-	2	2	3	-	-	2	2	-	2	4	5
	-	(1.7)	(1.7)	(2.5)	-	-	(1.7)	(1.7)	-	(1.7)	(3.4)	(4.2)
Totals	6	14	14	28	6	4	12	35	12	18	26	63
	(5)	(11.8)	(11.8)	(23.5)	(5)	(3.4)	(10.1)	(29)	(10.1)	(15)	(21.8)	(52.9)

Villages: 1-Nakalira 2-Shandumba 3-Bilibili 4-Wamono

5-Mfupi 6-Mukuyuni 7-Kamukuywa 8-Misemwa

In terms of villages, it was established that in total, Nakalira had the highest number 11.8% of children suffering from stunting while Shandumba and Bilibili had the lowest number 2.5% of children falling within the -3SD of the reference data for H/A. Also, Nakalira and Kamukuywa did not have any child falling within the normal range of reference population in terms of H/A.

Further comparisons were carried out to establish the nutritional status of girls in relation to boys within the eight villages. The results attained show that in total more boys (29.4%) fell within the -3SD of the reference population, compared to girls 23.5%. Equally the same

number of boys and girls 5% fell within the normal range of the reference data in terms of H/A index. In terms of village, it was established that in total more boys from Nakalira 7.6% were categorized in the $-3SD$ of the reference data, while the least number of boys falling within the $-3SD$ of the reference data came from Misemwa 1.7%. There were no boys falling within the normal range of the reference population, either from Nakalira, Bilibili, or Misemwa.

The highest total number of girls falling within $-3SD$ of the reference data came from Mukuyuni 5.9%, While no girl was categorized as falling within the normal range of the reference data from Nakalira, Wamono, Mfupi, Mukuyuni and Misemwa.

4.7.3: Height for Weight

Height for Weight index was determined in order to measure the degree of stunting and wasting within Ndivisi location among the pre-school children. The results show that both stunting and wasting were not very prevalent in the area. Thus, most of the children (39.5%) and were falling within the normal range of the reference data for the Height for Weight index. (Table 22).

The least number (9.2%) were categorized as falling within the $-3SD$ index of the reference data. The highest total number of children falling within the normal range index came from Shandumba 7.6% while the least number falling within this range came from Misemwa 3.4% and Bilibili 3.4%. Comparisons made between girls and boys showed that in total more girls 20.2% compared to boys 19.3% were falling within the normal range of the reference data index. However, more boys 5.9% fell within the $-3SD$ index of the reference population compared to girls 3.4%. Other comparisons between villages showed that in total Shandumba, Bilibili, Wamono, and Kamukuywa did not have any boys falling within the $-3SD$ of the

reference data. However, the highest number of those falling within the normal range came from Shandumba and Kamukuywa with each having 5% of the study population.

Table 22: Anthropometric measurements of pre-school children using NCHS reference standards H/W.

Village	Girls				Boys				Total			
	N	-1SD	-2SD	-3SD	N	-1SD	-2SD	-3SD	N	-1SD	-2SD	-3SD
	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %
1	1 (0.8)	1 (0.8)	2 (1.7)	2 (1.7)	2 (1.7)	1 (0.8)	5 (4.2)	1 (0.8)	3 (2.5)	2 (1.7)	7 (5.9)	3 (2.5)
2	3 (2.5)	3 (2.5)	- -	- -	6 (5)	1 (0.8)	1 (0.8)	- -	9 (7.6)	4 (3.4)	1 (0.8)	- -
3	1 (0.8)	2 (0.8)	1 (0.8)	1 (0.8)	3 (2.5)	2 (1.7)	3 (2.5)	- -	4 (3.4)	4 (3.4)	4 (3.4)	1 (0.8)
4	4 (3.4)	3 (2.5)	- -	1 (0.8)	3 (2.5)	3 (2.5)	- -	- -	7 (5.9)	3 (2.5)	- -	1 (0.8)
5	3 (2.5)	3 (2.5)	2 (1.7)	- -	2 (1.7)	2 (1.7)	1 (0.8)	3 (2.5)	5 (4.2)	5 (4.2)	3 (2.5)	3 (2.5)
6	6 (5)	4 (3.4)	3 (2.5)	- -	1 (0.8)	2 (1.7)	- -	2 (1.7)	7 (5.9)	6 (5)	3 (2.5)	2 (1.7)
7	2 (1.7)	6 (5)	1 (0.8)	- -	6 (5)	1 (0.8)	2 (1.7)	- -	8 (6.7)	7 (5.9)	3 (2.5)	- -
8	4 (3.4)	3 (2.5)	- -	- -	- -	2 (1.7)	1 (0.8)	1 (0.8)	4 (3.4)	5 (4.2)	1 (0.8)	1 (0.8)
Total	24 (20.2)	25 (21)	9 (7.6)	4 (3.4)	23 (19.3)	14 (11.8)	13 (10.9)	7 (5.9)	47 (39.5)	36 (30.3)	22 (18.5)	11 (9.2)

Villages: 1-Nakalira 2-Shandumba 3-Bilibili 4-Wamono

5-Mfupi 6-Mukuyuni 7-Kamukuywa 8-Misemwa

The only number of girls falling within the -3SD of the reference data in terms of H/W index came from Nakalira (1.7%), Bilibili (1.7%), and Wamono (0.8%). The highest number of girls falling within the normal range of the reference data came from Mukuyuni (5%).

4.7.4: Nutritional Status of children according to their Age.

Weight for Age

There was need to determine the Health status of pre-school children in relation to their age. This is important because it shows clearly which age is most affected by malnutrition. As a result all the sampled population of children was categorized after which their nutritional status was determined. The W/A Index showed that majority of the children sampled was in the age bracket 13-24 months 30.3% (Table 23).

Table 23: W/A GENERAL NUTRITIONAL STATUS BY AGE

Age Months)	Normal		-1SD		-2SD		-3SD		TOTAL	
	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)
6-12	3	(2.5)	1	(0.8)	-		10	(8.4)	14	(11.8)
13-24	2	(1.7)	4	(3.4)	9	(7.6)	21	(17.6)	36	(30.3)
25-36	5	(4.2)	5	(4.2)	2	(1.7)	8	(6.7)	20	(16.8)
37-48	4	(3.4)	12	(10.1)	7	(5.9)	5	(4.2)	28	(23.5)
49-60	3	(2.5)	9	(7.6)	6	(5)	3	(2.5)	21	(17.6)

Most of the children who fell below $-2SD$ index were also found to come from the age bracket 13-24 months. Children who were wasted formed 25.2% of the study population. The fact that they formed the biggest number of those wasted, could have been attributed to the fact that this age group is vulnerable, since this is the time when most of the children are being stopped from breast-feeding. If the children are not given a balanced diet which is energy dense, then they are vulnerable to malnutrition. Other observations showed that those within the normal range according to the W/A index were those of the age bracket 25-36 Months 4.2%. This could have been attributed to the fact that this is the age group when children have undergone complete weaning and can eat any type of food, thus not needing special diet nor care.

Height for Age

The Height for Age Index showed that majority of the children with problems of stunting were of the age bracket 13-24 months (Table 24). This formed 24.4% of the study population. This could have been caused by the fact that the age group formed the largest number of the children sampled. Also, it may have resulted from poor feeding practices of children within this age group especially during weaning. This is also the age group within which mothers stop breast-feeding. This can cause problems of nutrition especially if the right types of food are not administered.

Table 24: H/A GENERAL NUTRITIONAL STATUS BY AGE

Age(Months)	Normal	-1SD	-2SD	-3SD	TOTAL
	No (%)	No (%)	No (%)	No (%)	No (%)
6-12	5 (4.2)	-	2 (1.7)	7 (5.9)	14 (11.8)
13-24	2 (1.7)	5 (4.2)	7 (5.9)	22 (18.5)	36 (30.3)
25-36	1 (0.8)	5 (4.2)	2 (1.7)	12 (10.1)	20 (16.8)
37-48	3 (2.5)	4 (3.4)	7 (5.9)	14 (11.8)	28 (23.5)
49-60	1 (0.8)	4 (3.4)	8 (6.7)	8 (6.7)	21 (17.6)

Height for Weight

Further observations made on the nutritional status of pre-school children in terms of height for weight showed that the largest group of children who were categorized to lie in the normal range of reference data were those of the age bracket 37-48 months (Table 25). This could have been caused by the fact that this age of children were old enough and they were eating the normal diet of the household members.

4.7.5: Nutritional Status of Pre school Children In terms of Sub-locations

Other observations were done to compare the nutritional status of pre-school children between Magemo sub-location and Sitabicha sub-location. It was found that in relation to the W/A index, almost a quarter of the children in Magemo sub-location, 21.8 % fell within the –

3SD of the reference data, while only 17.6% from Sitabicha were in the same range (Fig 11). Also more children within Magemo sub-location, 32.8% fell within the $-3SD$ of the reference population in terms of H/A as compared to Sitabicha, 20.2% (Fig 12). However in terms of H/W, more children from Sitabicha 21% fell within the normal range of the reference population, while only 18.5% of those from Magemo fell within the $-3SD$ of the reference population (Fig. 13).

Table 25: H/W GENERAL NUTRITIONAL STATUS BY AGE

Age(Months)	Normal		-1SD		-2SD		-3SD		TOTAL	
	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)
6-12	4	(3.4)	3	(2.5)	4	(3.4)	3	(2.5)	14	(11.8)
13-24	4	(3.4)	16	(13.4)	9	(7.6)	6	(5)	35	(29.4)
25-36	9	(7.6)	7	(5.9)	3	(2.5)	2	(1.7)	21	(17.6)
37-48	17	(14.3)	9	(7.6)	4	(3.4)	-	-	30	(25.2)
49-60	13	(10.9)	4	(3.4)	2	(1.7)	-	-	19	(16)

Figure 11: Health status in terms of locations (W/A)

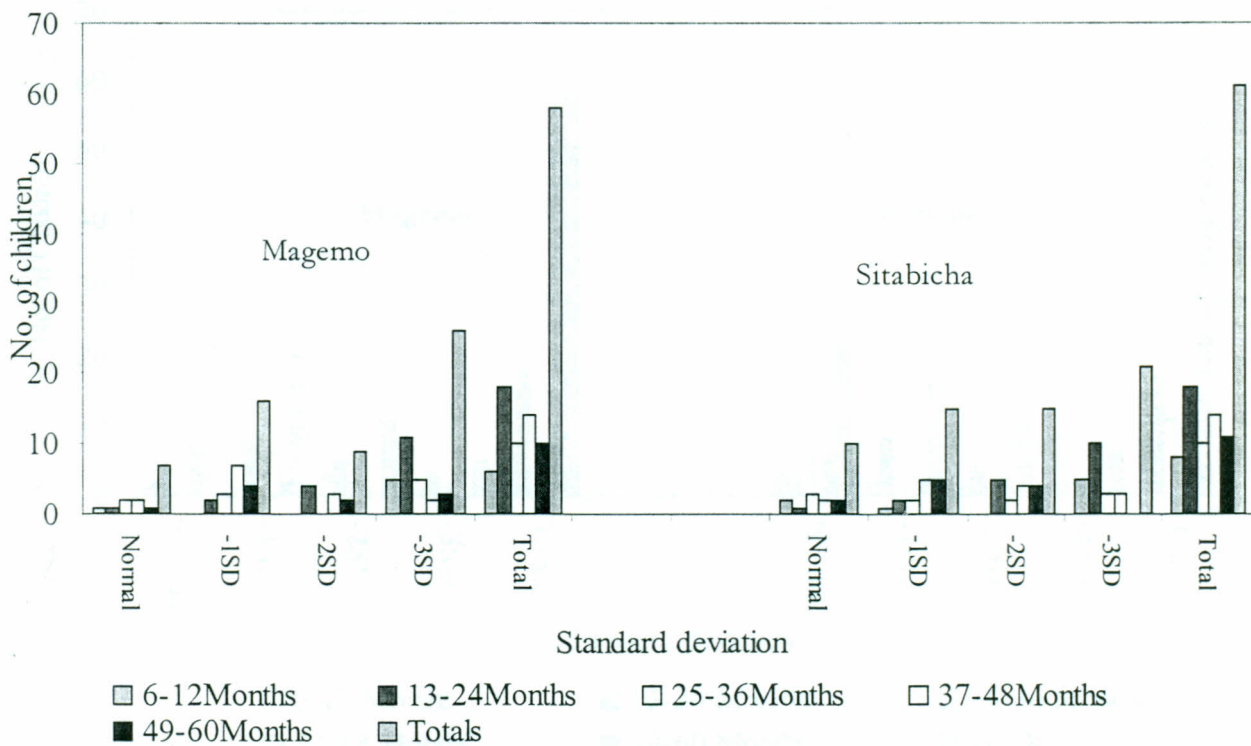


Figure 12: Health status in terms of locations (H/A)

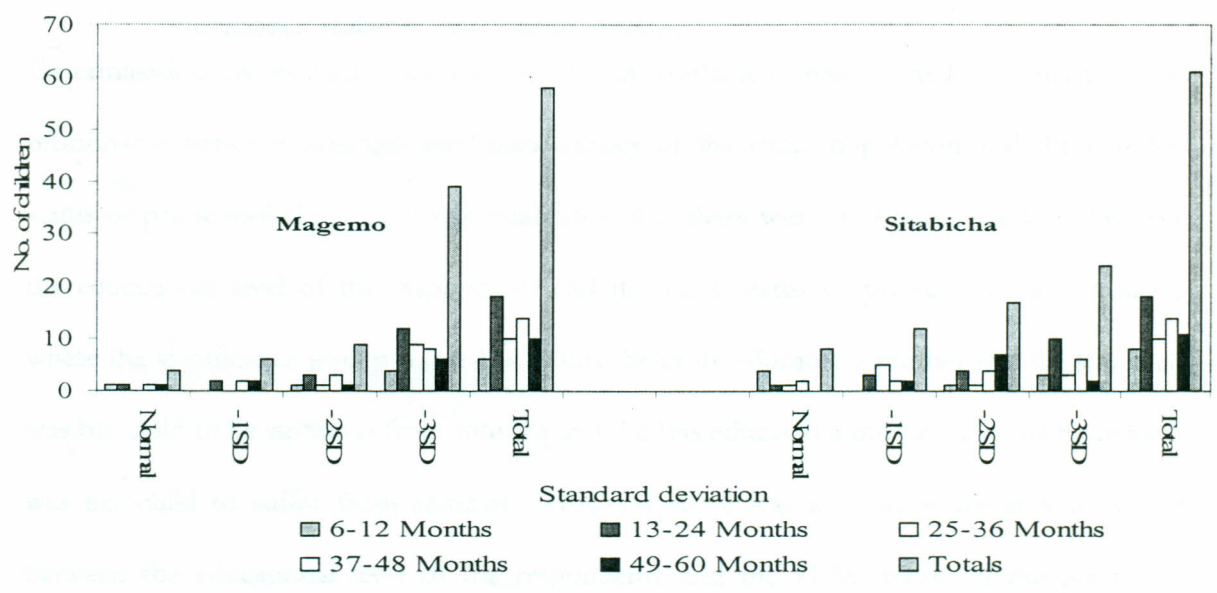
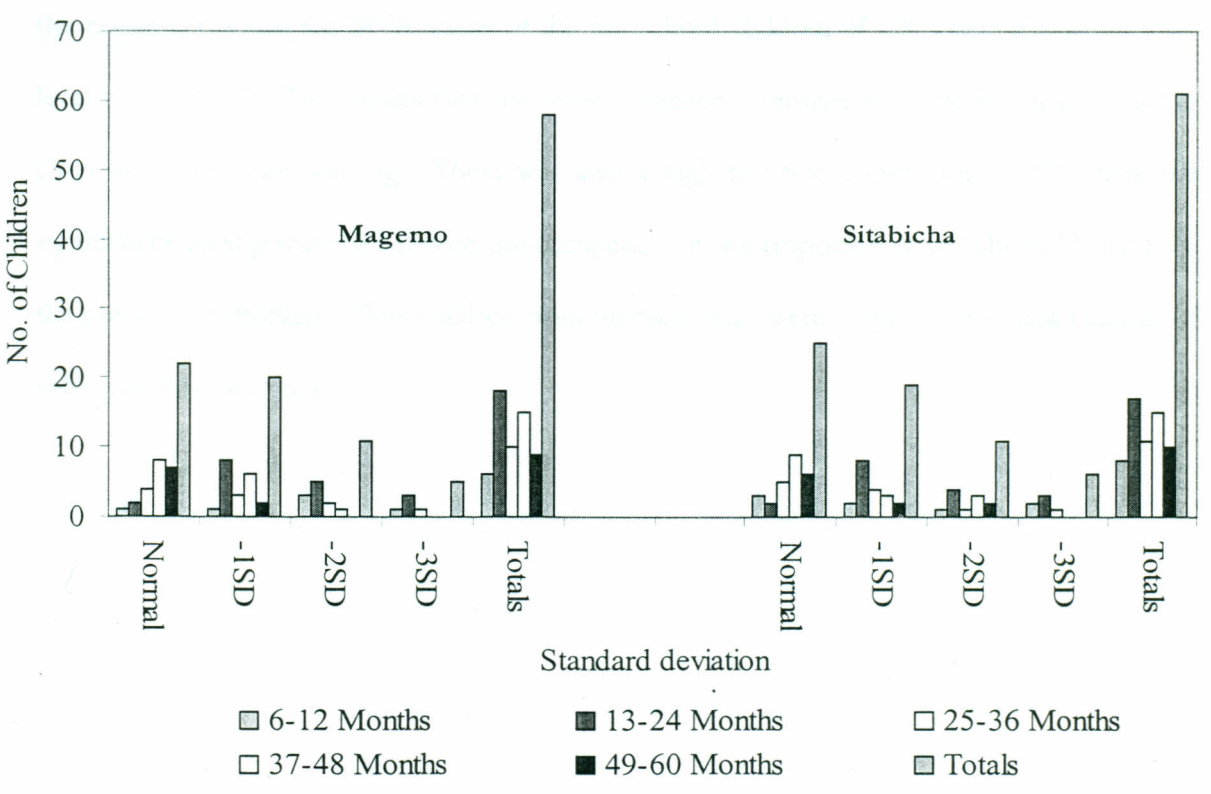


Figure 13: Health status in terms of locations (H/W)



4.7.6: Relationship between demographic characteristics and the nutritional status of pre-school children.

Determination of Pearson moment correlation coefficient was carried to determine the relationship between demographic characteristics of the study population and the nutrition status of pre-school children. It was established that there was a positive correlation between the educational level of the respondents and the H/A status of pre-school children at 0.5 where the significance level p was 0.451. Thus the more educated a mother was the less likely was her child to be suffering from stunting and the less educated a mother was, the more likely was her child to suffer from stunting. However there was a negative correlation of -0.4 between the educational level of the respondents and the H/W status of the pre-school children.

Further results show that there was a high positive correlation between the educational level of the respondents and the W/A status of the pre-school children of 0.8 where the significance level p was 0.162. This shows that the more educated a mother was, the less likely was her child to suffer from wasting. There was also a high positive correlation of 0.9 where the significance level p was 0.5 between the occupation of the respondents and the H/A status of the pre-school children. Thus children from mothers who were employed had less chances of suffering from stunting.

4.8: BREASTFEEDING PATTERNS

Respondents were expected to state whether their children were still breastfeeding. It was established that 53% of the respondents stated that their children were not being breastfed while 41% were breastfed and given supplementary food (Table 26).

Table 26: Whether the child is still breastfeeding

Whether the child is breast feeding Or not	SUBLOCATION 1 -MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Exclusively being breast-fed	- -	- -	- -	- -	2 (2)	- -	4 (4)	- -	6 (6)
Is not being breastfed	8 (8)	8 (8)	4 (4)	9 (9)	7 (7)	6 (6)	3 (3)	8 (8)	53 (53)
Breastfed and Given supplementary food	5 (5)	4 (4)	9 (9)	3 (3)	3 (3)	6 (6)	6 (6)	5 (5)	41 (41)
Total	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Only 6% responded that their children were being exclusively breastfed. There were only two villages in which exclusive breastfeeding was reported, namely Shandumba 2% and Mfupi 4%. The highest number of mothers who were not breast-feeding was found in Misemwa 9% and Shandumba 7%. An equally high percentage of mothers who were breast-feeding and giving supplementary foods were found in Nakalira 9%.

Mothers were also expected to state when their children stopped breast-feeding. This was applicable in all cases whether the mother was breast feeding or not. According to the responses attained it was established that majority of the mothers (70.7%) stop breastfeeding their children when they are between the age of one and two years (1-2) (Table 27).

Table 27: If not being breastfed the age when it stopped

	SUBLOCATION 1 -MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Less than 6 months	3 (5.2)	-	-	-	-	-	-	1 (1.7)	4 (6.9)
7 months – 1 year	2 (3.4)	-	-	1 (1.7)	1 (1.7)	-	2 (3.4)	1 (1.7)	7 (12.1)
1-2 years	5 (8.6)	8 (13.8)	4 (6.9)	7 (12.1)	3 (5.2)	5 (8.6)	2 (3.4)	7 (12.1)	41 (70.7)
More than 2 years	-	-	-	1 (1.7)	2 (3.4)	1 (1.7)	1 (1.7)	-	5 (8.6)
Never breast fed	1 (1.7)	-	-	-	-	-	-	-	1 (1.7)
Total	11 (18.9)	8 (13.8)	4 (6.9)	9 (15.5)	6 (10.3)	6 (10.3)	5 (8.5)	9 (15.5)	58 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

Then 12.1% stopped breastfeeding their children when they are aged 7 months to one year while only 6.9% stopped breastfeeding their children when they were less than 6 months. Very few mothers 8.6% stopped breast-feeding their children when they were more than 2 years. The least number of mothers 1.7% never breastfed their children which was attributed to factors such as the mothers going to study. In terms of villages, the highest number of

mothers who stop breastfeeding their children when they are between 1-2 years comes from Wamono 13.8%, Misemwa 12.1% and Mukuyuni 12.1%. The only case of children who never breast-fed came from Kamukuywa 1.7%.

The respondents were expected to explain reasons for stopping breastfeeding. More than a quarter of the number (30.6%) stopped breastfeeding because of pregnancy (Table 28).

Table 28: Reasons for stopping breast-feeding.

Reasons for not breast-feeding	SUBLOCATION 1 -MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Because of Pregnancy	1 (1.6)	4 (6.5)	- -	3 (4.8)	3 (4.8)	1 (1.6)	3 (4.8)	4 (6.5)	19 (30.7)
The child was of age	1 (1.6)	2 (3.2)	3 (4.8)	5 (8.1)	1 (1.6)	1 (1.6)	- -	- -	13 (21)
Because of sickness	- -	1 (1.6)	- -	- -	1 (1.6)	- -	- -	- -	2 (3.2)
Because of lack of milk	1 (1.6)	- -	1 (1.6)	- -	- -	1 (1.6)	2 (3.2)	1 (1.6)	6 (9.7)
To make the child eat	1 (1.6)	- -	- -	- -	- -	3 (4.8)	- -	- -	4 (6.5)
Mother not always With child	4 (6.5)	1 (1.6)	1 (1.6)	1 (1.6)	2 (3.2)	3 (4.8)	2 (3.2)	4 (6.5)	18 (29)
Total	8 (12.9)	8 (12.9)	5 (8)	9 (14.6)	7 (11.2)	9 (14.6)	7 (11.2)	9 (14.6)	62 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

This is because mothers believe that if they continue with the practice while pregnant; it may endanger the life of an unborn baby. The most common practice was to take the child to the grandmother or a close relative for an average period of 3 months to discontinue the practice.

Other respondents stated that breastfeeding was discontinued when the mother was absent either temporarily or permanently 29%. These included cases when a mother went away for studies or in case of runaway mothers from unstable marriages. Other instances included when a mother went for a visit, a funeral or went to take care of a patient in hospital and the demand was to stay there for between 3 weeks to one month. In other occasions mothers were busy with business or were away most of the day doing manual work for other people to earn a living. With time the child ended up being disinterested with breast milk. From the responses attained it can be ascertained that most mothers did not understand the need for continuous breast-feeding especially within the first three months. This could thus have resulted in the reduction of the flow of milk, and finally to the drying up of breast milk prematurely.

There were also instances when mothers discontinued breastfeeding because they thought the child had come of age 20.9%. In other circumstances breastfeeding was stopped in order to make the child eat other foods (6.4%). However this was done in very few cases. This is an indication that the mothers did not understand the need to continue breast-feeding, as long as there is flow of milk. Since mothers attributed reasons for stopping breast-feeding on pregnancy, there was need to find out those who were pregnant. From the results only (17%) were pregnant while the rest 83% were not pregnant when the study was being carried out.

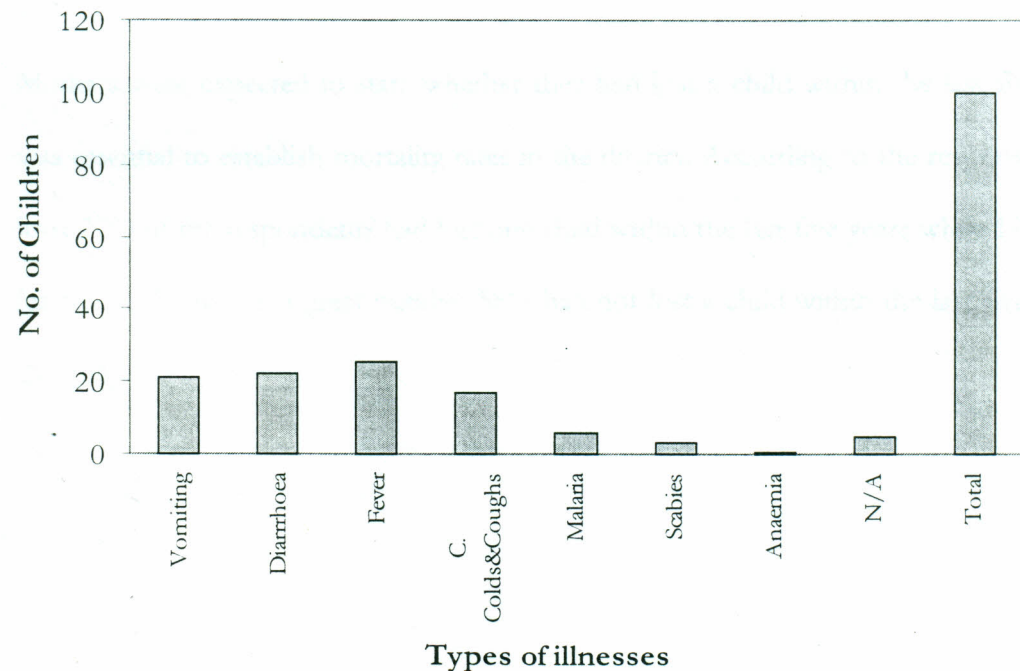
4.9: MORBIDITY AND MORTALITY OF CHILDREN

The study wanted to establish types of illnesses the children had suffered within the last seven days before the study. It was established the most common illness was fever (25.4%) (Fig. 14), which could be an indicator of the high prevalence of malaria in the area under study.

Also diarrhea 22.1% was a very common ailment and most mothers referred to it as teething and weaning diarrhea, especially when leguminous foods such as bread were given. However it may have been caused by poor water consumed by the study population, unhygienic methods of food preparation and premature weaning practices. Those who suffered from vomiting were equally many making up 21.2% of the study population.

Another common ailment was the common cold, which affected 17.1% of children under study. Those who had scabies made up 3.2% of the study population. These incidences of colds and scabies could be attributed to methods of food preparation especially the indigenous vegetables.

Figure 14: Types of illnesses



In most cases, sodium bicarbonate was added to indigenous vegetables when cooking, and this may have affected the availability of vitamin C, which is useful in the prevention of the above ailments. Also, though a large proportion of the people grow fruits, they often end up being sold on the local market leaving none for household consumption. Some mothers blamed causation of ailments such as scabies on the kind of food they ate at pregnancy, such as sim sim and red tomatoes. Additionally the occurrence of scabies was believed to result from a tradition called “Lirumbi” or people from the blacksmith clan, whereby if such a skill is not practiced by members of this clan, they develop rushes and boils. This believe was very rampant such that even children who had scabies were often taken to a traditional healer instead of being taken to hospital for medical attention.

Apart from these, the mothers attributed the occurrence of some ailments to children being looked at with bad eyes. It is with this in mind that some of them failed to take their children to hospital when sick. They were instead taken to traditional doctors who are believed to remove any evil spirits causing such sicknesses (*Bikumba* or *Ebikhokho*).

Mothers were expected to state whether they had lost a child within the last five years. This was essential to establish mortality rates in the district. According to the responses attained at least 27% of the respondents had lost one child within the last five years while 11% had lost at least two. However, a great number 58% had not lost a child within the last five years (Table 29).

In terms of villages Nakalira reported the highest number of child mortality. In this case 7% of the respondents reported to have lost at least one child within the last five years, while 6% had lost at least four children within the last five years. Child mortality rates were lowest within Kamukuywa and Misemwa where 9% of the respondents had not lost a child within the last five years.

Table 29: Mortality rates of children

No of children who have died per household within the last 5 yrs	SUBLOCATION 1 -MAGEMO				SUBLOCATION 2 SITABICHA				TOTAL
	Villages				Villages				
	1	2	3	4	5	6	7	8	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
1	2 (2)	5 (5)	7 (7)	2 (2)	2 (2)	2 (2)	4 (4)	4 (4)	27 (27)
2	1 (1)	3 (3)	-	1 (1)	2 (2)	2 (2)	-	2 (2)	11 (11)
3	1 (1)	-	-	-	-	-	1 (1)	-	2 (2)
4	-	-	6 (6)	-	1 (1)	1 (1)	-	-	2 (2)
None	9 (9)	4 (4)	-	9 (9)	7 (7)	7 (7)	8 (8)	7 (7)	58 (58)
Total	13 (13)	12 (12)	13 (13)	12 (12)	12 (12)	12 (12)	13 (13)	13 (13)	100 (100)

Villages: 1-Kamukuywa 2-Wamono 3-Nakalira 4-Misemwa

5-Shandumba 6-Bilibili 7-Mfupi 8-Mukuyuni

CHAPTER 5

SUMMARY OF MAJOR FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.0: INTRODUCTION

5.1: AIMS AND PURPOSE OF THE STUDY

The purpose of this study was to determine the type of food given to pre-school children, methods of food preparation and weaning practices employed, and to establish socio-cultural and economic factors that influence the type of food given to pre-school children.

5.2: RESEARCH OBJECTIVES

The study sought to achieve the following six objectives:

1. To determine the nutritional status of pre-school children.
2. To establish the types of foods given to pre-school children.
3. To explore the methods used in food preparation and weaning practices used.
4. To identify the social, economic, cultural and psychological factors that influence the nutritional status of pre-school children.
5. To establish the relationship between demographic characteristics and nutrition status of pre-school children.
6. To find out breast feeding patterns of the mothers.

5.3: METHODS AND MATERIALS

Cluster sampling method was used to get 100 households from Ndivisi Location, Bungoma District, Western Kenya. In Ndivisi Location there are two sub-locations namely Sitabicha and Magemo. In each sub-location four villages were randomly sampled for purposes of the study. Afterwards households with children between the age of 6 months and five years were purposively selected for the study except for those whom accessibility was a problem. A total of 100 households were thus selected while anthropometric measurements of 119 children were taken in terms of W/A, H/A, and H/W. Structured interviews were also carried out in the sampled households, whereby mothers or people better placed to give appropriate information were interviewed. Observation checklists were also used to collect additional information.

Data was then analyzed whereby descriptive statistics such as frequencies, percentages, and means were used to organize and summarize numerical data on socio-economic and demographic characteristics of the respondents. Pearson Moment Correlation Co-efficient was used to establish demographic factors that significantly relate to the nutritional status of pre-school children.

Nutritional status of children in terms of weight for age (W/A), Height for Age (H/A) and Height for Weight (H/W) were analyzed using data from the National Center for Health and Statistics (NCHS) reference standards for pre-school children (WHO, 1983).

Qualitative data was analyzed using Miles and Huberman, (1994) six steps of analyzing qualitative data namely; Reconstruction, coding, pattern coding, Memoing, Display format, and then Drawing and Verifying conclusions.

5.4: MAJOR FINDINGS

5.4.1: *Demographic Characteristics*

From the results obtained, the demographic survey showed that almost half, 44% of the respondents lie in the age bracket 30-39 years. Most respondents 89% are married while the dominant family type is monogamy. Though most respondents had received some education, a larger proportion, 32% had only received some primary education. Among the households studied, most 34% had between 4-6 members or 7-8 members, 32%. These could be attributed to communal lifestyle of the members and the poor use of family planning methods. Most households 71% had breast-feeding members which shows that the reproduction rate is very high in the community.

5.4.2: *Socio-Economic Information*

From the results of the study, very few household heads, 22.8% had a steady salaried occupation. The most common method of earning a living was petty businesses 27%, such as buying and selling cattle, selling sugarcane at retail prices, making and selling ropes, baskets and traditional granaries and taking photographs. Only 1% of the spouses were employed and thus were earning a steady income. This concurs with (UNICEF, 1996) findings that males are more literate than women and are therefore better placed to get steady jobs. The most common source of income for spouses was selling bananas (32%) which is a staple crop in the area.

Further results show that, a majority of the respondents (91%) own land. However, they were small landholders owning between 1-2 acres 41%. Out of these, an overwhelming majority (82%) were not leasing out land because of size, while an equally big proportion (70%) did not rent out their land.

The study also gathered that, though the area is in a high potential region, some people (42.9%) had to buy food at least in the course of the year. Most people attributed these to small sizes of land, large households, and the fact that inputs such as seeds and fertilizers were too expensive, forcing them to do true breeding. Apart from land, the most commonly owned property in the form of domestic animals were birds, mainly chicken which made up 42.1% of the responses.

The quality of the house one lives in can act as a good measure of the socio-economic status of an individual. Hence according to observations made, 89% of the houses had walls made of mud, 53% had grass thatched roofs, while a very large proportion (90%) had their floors made of mud. This shows that the study population was generally from a low-income level group. Also, only (43%) had drying racks for utensils.

However, many respondents (72%) had set a side a separate room/house to act as a kitchen, while more than a half (59%) of the main houses studied only had two rooms. Additionally, almost three quarters of the households (72%) had pit latrines. However most of them were temporary structures, which could collapse any time. This is because, the walls were either

made of maize stalks or banana fibers and in some cases polythene bags. Most of them had no roofs or doors. The floor was left intact with grass and these latrines doubled up as bathrooms.

5.4.3: *Breastfeeding and Weaning Practices*

Breast-feeding practices in the area are well established. From the results slightly under half, 41% of the mothers were breast-feeding their children and giving supplementary food. Also, of the total population, 70.7% stop breast-feeding their children at the age of 1-2 years. This is because most mothers do not have a steady salaried employment, hence they spent a lot of time with children, thus prolonging the practice. Other results by UNICEF, (1996) show the same trend in that almost 97% of all infants are put to the breast at birth, 90% continue breast-feeding at one year while the practice declines to about 49% at two years of age. From the study the main reason for stopping breast-feeding is pregnancy 30.6%.

Results on weaning patterns portray that less than half of the mothers (41.1%) feed their children on carbohydrate food. The main weaning food is porridge. The most common method of preparing food for pre-school children is by boiling and stewing. However, the porridge is not made energy dense by adding margarine or oil as recommended by UNICEF, 1996. In only rare cases was there the addition of sugar and milk owing to the fact that they are expensive commodities. However, varieties of indigenous grains and tubers such as millet or sorghum and cassava were rarely used as weaning foods. If flour from traditional grains would be used to make weaning porridges it would greatly improve the nutritional status of pre-school children. When available, traditional grains were used to make traditional brews such as "*ibang'a*" and "*Busaa*"; or sold as they fetch a high price on the local market.

Only 44.6% of the children are fed using a cup and a spoon. This shows that mothers were aware of the poor effects attained when children are bottle-fed.

Despite the need for children to eat alone or before adults have eaten, it was observed that in many households children ate their meals with adult (66%). This would thus affect the amount of food they consumed as they always ate at a slower pace. Also by eating last they ate the left-over food which in some cases was not enough or was poor nutritionally. However, the practice may be emanating from the Bukusu culture, whereby the household head and/or visitors ate first then women and children.

5.4.4: Cultural Practices and Beliefs Related to Food

According to cultural practices and beliefs related to food, it was established that in more than a half of the households (69%) children were prevented from eating one food or another. Among the foods the children were not supposed to eat, slightly more than a half (51.9%) were not supposed to eat meat from a cow with stripes (*eng'enda*) nor drink its milk. The belief was that if any of these were consumed, then the body would develop rashes. Also, the particular cow was sacred and hence was used for carrying out traditional ceremonies such as funerals.

Further results show that in the majority of the households, the person taking care of the children was the mother (84%). Additionally, mothers had the greatest influence, 37% on the type of food given or prevented from children. On average, every mother interviewed had between 4 and 6 children 42%. Majority of the mothers interviewed (83%) were not pregnant.

5.4.5: Morbidity, Mortality, and Sanitation

The study established that about a quarter of the Children studied (25.3%) had suffered from fever. A related study showed that half of the children (50.2%) had fever or malaria related cases which were the highest (UNICEF, 1996). A sizable proportion of the children (22.1%) had suffered from diarrhoea. This could be attributed, to lack of clean sources of water for use in drinking and preparing food and general poor hygienic standards in which food is prepared. Observations made during the course of the study showed that the kitchen is often left dirty, littered with dirty utensils, thus attracting flies. In other cases, left over food was left uncovered thus further attracting flies.

Child mortality rates established that slightly more than a quarter (27%) of the households recorded having lost a child within the last five years.

Further results show that, slightly over half of the respondents (51.3%) get water for use and drinking from unprotected water sources. Of the same population 60.8% were getting water for use and drinking from rivers and streams. Disposal of refuse shows that more than a half of the respondents (56.7%) throw their household refuse on the farm.

5.4.6: Child Nutritional Status

Results of the anthropometric data in relation to the reference data of the National Center for Health and Statistics (NCHS) WHO, (1983) show that within Ndivisi Location, children suffering from stunting make up 24.4% of the study population falling between the age of 13-24 months. Accordingly, those suffering from wasting make up 25.2% of the same age bracket.

However, the H/W index in the area indicates that 39.5% of the children fall within the normal range of the reference population.

In terms of sex, most girls fall within $-1SD$ of the reference population in terms of W/A thus suffer from mild wasting, whereas more boys fall within $-3SD$ of the reference data in terms of W/A. In this case boys are severely wasted. Also more boys (56.2%) suffer from stunting whereas more girls fall within the normal range of reference data in terms of H/W.

In terms of villages, Nakalira had the highest number of children (8%) suffering from severe wasting. The same village has the highest number of children suffering from stunting (11.8%). On the other hand, Shandumba had the highest number of children falling within the normal range of reference population in terms of W/A. The poor state of nutrition among children within Nakalira, may have been as a result of small land ownership and the fact that the land was generally rocky making unsuitable to grow food crops

5.5: CONCLUSIONS

From the study it can be ascertained that there was the existence of malnutrition among pre-school children. This may have been caused by several factors either at the household or community level. The most prevalent was severe stunting (52.9%) while only a few children (39.5%) suffered from severe wasting.

Demographic findings show that many mothers (32%) had only received some primary level education. This would thus affect their knowledge on the type of foods to give to pre-school children, food preparation methods and it would give them less opportunities to get steady

salaried employment, as was evidenced by the study. Without income a mother cannot buy children nutritious food which may eventually have an effect the nutritional status of pre-school children.

Results on the socio-economic status of household heads shows that very few are employed (22.8%), and are earning a steady income. Hence they mainly earn a living by engaging themselves in petty business (27%). This goes a long way in contributing to the poor nutritional status of the pre-school children, especially if they do not get enough income to feed their families.

Many respondents in the study area (41%) own between 1-2 acres of land. As a result, about 43.9% had to buy food in the course of the year. Thus, it would be hard to attain nutritious food for pre-school children, which would thus affect their nutritional status (NUS).

Other measures of socio-economic status were able to show that an overwhelming majority of the respondents (89%) had mud walled houses, 53% had grass thatched roofs, while 90% had mud floors. This is an indication that the study population was made up of people who were of low-income levels. This would thus have an influence in attaining things like health services, and/or food, hence affecting the NUS of the pre-school children even further.

The study also established that 25.4% of the children had suffered from fever within the last seven days while 22.1% had suffered from diarrhoea. Diarrhoea could have been enhanced by

the type of water taken since 51.3% drunk water from unprotected sources. Such ailments interfere with the digestibility of the food and may affect the NUS of the children.

Though most respondents had pit latrines (72%), the remaining proportion was still big enough not to have basic facilities like toilets. Also only 43% of the respondents had drying racks for utensils. This affects the hygienic standards of the environment and quality of drinking water which would increase the occurrence of water born diseases, and thus affect the nutrition status of the pre-school children.

Feeding patterns of the pre-school children shows that 70.7% of the mothers stop breastfeeding their children when they are between the age of 1-2 years. This could be related to the fact that by this age most children will have completely been weaned, and were eating normal adult diet. The most common weaning foods were from the carbohydrate group, the main one being maize meal porridge (41%). Only very few mothers made it energy dense thus, affecting the rapid growth of the pre-school children which is essential within the first year of life. When the right Height for Age index is not attained, then chronic malnutrition starts setting in even at an early age, and finally has an influence on the NUS of the child.

Cultural practices and beliefs related to food are prevalent in the area, since 69% of the children are not supposed to eat one type of food or the other. In this case, most children are not supposed to eat meat from a cow with stripes (en'genda), neither should its milk be consumed. Considering the nutritive value of meat and milk such a tradition denies children

essential proteins needed at this period of their life. This may contribute to the poor NUS of the pre-school children and poor mental development.

Correlation done between the nutritional status of pre-school children and demographic characteristics, showed some positive correlation. For instance it was established that there is a high positive correlation between the educational level of the respondents and the W/A status of the pre-school children. Further the occupation status of the respondents and the H/A status of the pre-school children showed a high positive correlation. In this case children of mothers who had a high level of education were less likely to be wasted, while those from respondents who were employed had less chances of suffering from stunting.

Therefore the poor nutritional status of the pre-school children may be caused by lack of steady incomes by the household heads and their spouses, low levels of education of the respondents who were mainly mothers, poor weaning and feeding patterns of pre-school children, and the existence of food taboos. Other likely causes could have been prevalence of illness and the existence of poor sanitary conditions.

As a result the government needs to set up programs that could improve peoples incomes and set up feeding programs to improve the nutritional status of pre-school children within Ndivisi location.

5.6: RECOMMENDATIONS

1. There is need for people from public health department to emphasize the need for having toilets, composite pits and maintaining home compounds clean.
2. There is need for campaigns to enhance the use of family planning methods in the area.
3. There is need for mothers to be educated on the importance of making weaning foods more energy dense and thus the mothers should be shown this practically. This can easily be done by community extension workers.
4. The research population needs to be educated on the importance of using traditional grains to prepare weaning porridges. This can be done by community extension workers together with the ministry of agriculture
5. The study population needs to be educated on the importance of boiling drinking water since they mainly use unprotected water sources for household use. This can easily be done by the Ministry of health under the department of public health
6. There is need for campaigns to be carried out by nutritionists to discourage people from practicing outdated cultural beliefs related to food.

5.7: SUGGESTIONS FOR FURTHER RESEARCH

1. A similar research should be carried out using longitudinal methods to establish nutritional status of children during bumper harvest and during periods of food scarcity.
2. Studies should be carried out to establish methods used in preparing indigenous vegetables and how they affect their nutritive value.
3. There is need for studies to be carried out on child care practices in the area.
4. A study needs to be carried out on awareness of the study population on hygiene practices in relation to food preparation, use of clean water for drinking, cooking and washing utensils
5. A similar study should be carried out in other areas in Kenya to produce comparative data.

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APPENDIX 1

INTERVIEW SCHEDULE

SECTION 1: BACKGROUND OF INFORMATION

Sub-location _____ Date _____

1. Household head's Name _____
2. Is household head alive?
Yes [] No []
3. Respondents Name _____
4. Relationship to household head
Household head himself/herself []
Spouse []
Daughter []
Son []
Worker []
Relative (specify) []
5. Sex
Male [] Female []
6. Age _____
7. Marital status
Married []
Single []
Widow []
Seperated Temporarily []
Divorced []
8. Type of family
Polygamous []
Monogamous []
Single parent family []
9. Religion
Christian []
Muslim []
Other (specify) []
10. Educational level
None []
Some primary []
Completed primary []

- Completed secondary
- Post secondary
- University

11. What is your occupation

- Self employed
- Employed by a person or organisation
- Other (specify) _____

SECTION 2: SOCIO - ECONOMIC BACKGROUND

12. List all (only permanent resident) members of the household currently staying here (including temporary visitors).

Name	Relationship to household head	Sex	Age	Level of Education	Occupation	Breast feeding members

13. State the income level of

- (a) Current household head _____
- (b) Spouse _____

14. Is the household head alive?

- Yes No

If yes list his/her 3 main sources of income

- (a) _____
- (b) _____
- (c) _____

15. If household head has spouse, list her/his 3 major sources of income

- (a) _____
- (b) _____
- (c) _____

16. Do you own or rent any land?

- Yes No

• If yes fill table below

Land	Average	Under cultivation	Fallow
Own			
Rent			

17. Do you farm? Yes [] No []

If yes fill the table below

Crop Grown	Name type	Do you have food in store		If not why?
		No	Yes	
a) Subsistence crops				
✓ Root tubers				
✓ Cereals				
✓ Pulses				
✓ Vegetables				
✓ Fruits				
✓ Oil related crops				
b) Cash crop				
✓ Maize				
✓ Sugarcane				

18. Are there times in a year when you have to buy food?

Yes [] No []

Explain reason for yes or No _____

19. Do you keep any Animals

Yes [] No []

If yes fill the table below

Type of Animal (Tick)	Number
Cows	
Sheep	
Goats	
Pigs	
Chicken	
Donkeys	

SECTION 3: BREASTFEEDING AND WEANING PRACTICES

20. State whether the child is
- Exclusively being breastfed
 - Is not being breast-fed
 - Is being breastfed and given supplementary food.
- (a) If the child is not being breastfed at what age did you stop breastfeeding?

(b) why did you stop breastfeeding at this age

22. If the child is being breastfed and given supplementary food.
- At what age did you introduce these other foods

What type of food is the child being given now and how is it prepared? (indicate the age)

Dish	Ingredients	How it is prepared

23. Which mode of feeding do you use?
- Cup and spoon
 - Bottle
 - Hand
 - Other (specify)

24. Do children eat alone or are they served meals with adults (Tick appropriately);

Eat alone []

Eat meals with adults []

Eat after adults have eaten []

Eat before adults have eaten []

Other (Specify) _____

SECTION 4: CULTURAL PRACTICES AND BELIEFS RELATED TO

FOOD

25. Are there foods which pre-school children are not supposed to eat

Yes [] No []

If yes Which ones

Food not eaten	Reason

If not Explain why? _____

26. Who influences the type of food you give or forbid the child from eating?

(a) The grand mother of the child

(b) The father of the child

(c) The clan of the child

(d) Other (specify)

Name one of your most preferred food you give to the child

Ingredients _____

28. Name one of the foods you do not like giving the child

Ingredients _____

Anthropometry information

Complete one for each child between 6-48 months of age.

29. Name of the subject _____

30. Sex _____

31. Date of birth _____

32. If the person is not the mother, state the
Relationship of the care taker to the child

33. Age of Mother/care taker in years

34. Is mother/pregnant now _____

35. How many times has the mother been pregnant

36. How many children does the mother have?

How many children does the mother have below five (5) years?

Anthropometry

38. Weight to the nearest 0.1 kg.

39. Height to the nearest 0.5 cm

SECTION 6: MORBIDITY INFORMATION

To be addressed to the care taker of the index child.

40. Within the last seven days has this child had any of the following illness?

Vomiting

Diarrhoea

Fever

(Tick where appropriate).

How many children below four years have died within the last five years?

SECTION 7: SANITATION

42. Indicate your main source of water

(Tick Appropriately).

Water sources	Rain season	Dry season	Protected	
			Yes	No
a) River stream				
b) Tap				
c) Bore hole				
d) Well				
e) Rain water				

43. Where do you throw your rubbish?

Composite/Waste bin []

Burying in the ground []

Burn regularly []

Throw Anywhere []

Other (specify) []

Observation checklist 1. quality of house

44. Investigator Appraises the quality of the House and fill the following items correctly.

Wall	Roof	Floor	Kitchen
a) Brick	a) Iron	a) Wood	a) Present
b) Mud	b) Grass	b) Mud	b) Absent
c) Wood	c) Other (Specify)	c) Cement	
d) Other (specify)		d) Other (specify)	

45. Number of rooms in the house. _____

Observation checklist 2. sanitation.

Observe the home for the present of

- (a) Pit latrine
- (b) Drying rack for utensils
- (c) Distance of Toilet from kitchen.

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